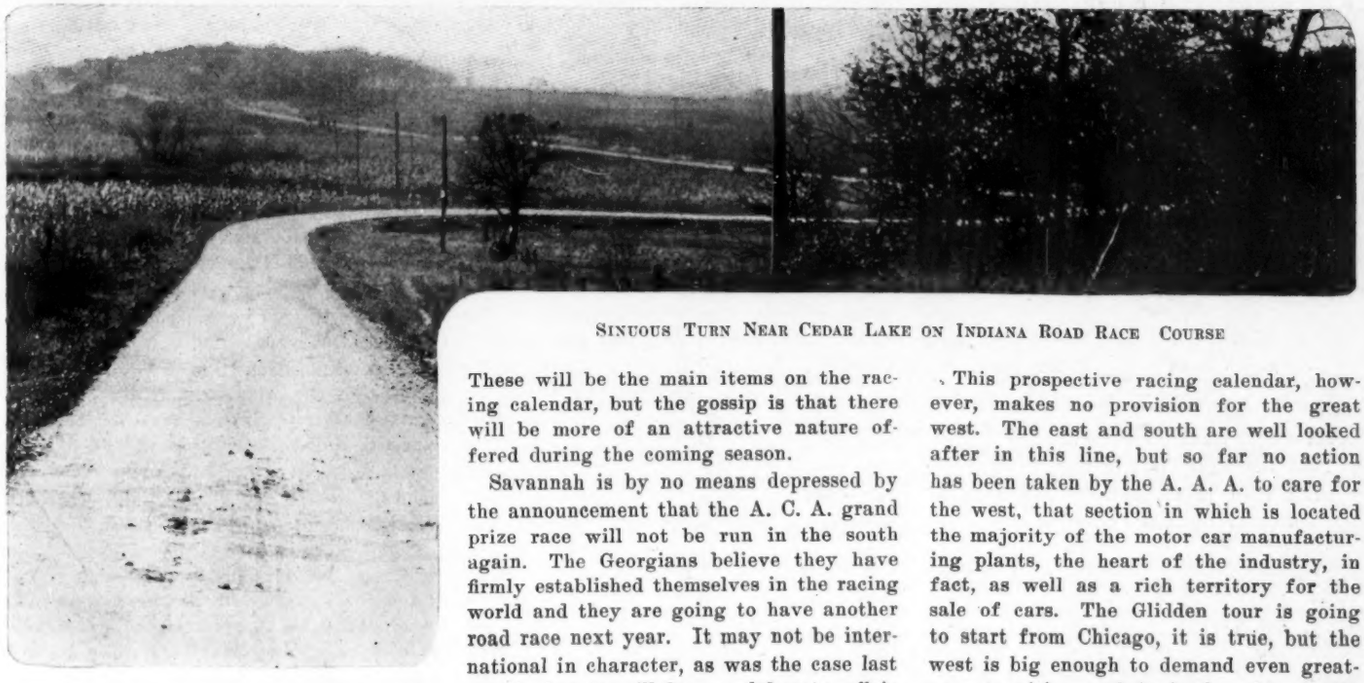
VOL. XIV. No. 24 CHICAGO, DECEMBER 10, 1908 $3.00 PER YEAR

MOTOR AGE

WHY NOT A ROAD RACE IN MIDDLE WEST?



SINUOUS TURN NEAR CEDAR LAKE ON INDIANA ROAD RACE COURSE

CHICAGO, Dec. 7—It can be safely presumed that the contest season for 1908 is at an end save for one of two hill-climbs and reliability runs of purely local character, and it is with perplexity that the motoring wiseacres face the coming year because of the abolishing of the racing board of the American Automobile Association which will leave the situation at sixes and sevens until Chairman Hower, of the new contest board, which incorporates the racing board, has a meeting of his committee and clarifies the atmosphere by a declaration of the intentions of the national organization.

Road racing, of course, will be the main course of the sporting menu, for the A. A. A. most effectually squelched the track game when it decided hereafter not to sanction meets held on courses not over a mile in circumference. But just what the A. A. A. will have to offer in the road racing line is uncertain as yet. It is known that the Vanderbilt and the A. C. A. grand prize race will be renewed, with both of them being run over the Long Island motor parkway by a racing club which has as yet not been announced. These will be the main items on the racing calendar, but the gossip is that there will be more of an attractive nature offered during the coming season.

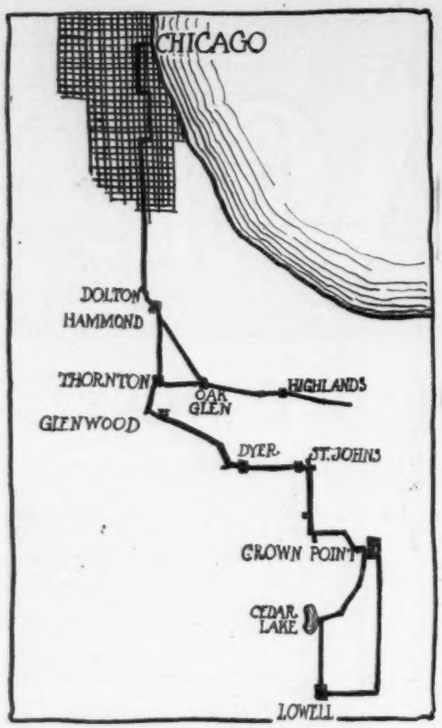
Savannah is by no means depressed by the announcement that the A. C. A. grand prize race will not be run in the south again. The Georgians believe they have firmly established themselves in the racing world and they are going to have another road race next year. It may not be international in character, as was the case last month, but it will be an elaborate affair which is expected to attract a big entry list, probably made up of American manufacturers who have the racing fever and who do not care to go to the expense of building special racers for the Vanderbilt or the American grand prize renewals next summer.

Plans of Savannah For 1909

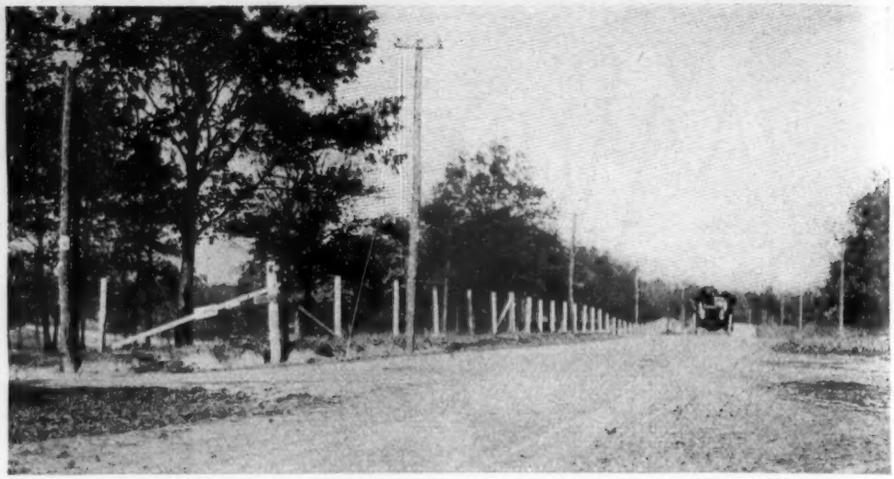
Savannah, however, will alter the date of its fixture and the race probably will be run several days prior to Thanksgiving. While the last one was a huge success from nearly every standpoint, still it conflicted with the holiday church services and caused some hard feeling in the Georgia metropolis. The church people refused to postpone the church services even for civic pride and in addition many of the Savannahans found that by going to the road race they had to pass up their holiday dinners. So it is believed to be best to make the race a few days earlier.

This prospective racing calendar, however, makes no provision for the great west. The east and south are well looked after in this line, but so far no action has been taken by the A. A. A. to care for the west, that section in which is located the majority of the motor car manufacturing plants, the heart of the industry, in fact, as well as a rich territory for the sale of cars. The Glidden tour is going to start from Chicago, it is true, but the west is big enough to demand even greater recognition and it is for this reason

SIX MILES STRAIGHTAWAY TO LOWELL



PROXIMITY OF COURSE TO CHICAGO



RIGHT HAND TURN NEAR CROWN POINT RACE TRACK

that a claim is being filed for the proposed stock chassis road race of the American Automobile Association, one of the few national plums.

West Offers Road Race Course

That the west is fully able to care for such a race is claimed by residents of the states of Indiana and Ilinois who are working in harmony to get the sanction for such a contest. With that end in view there has been unearthed what is regarded as a fine course within a short 2-hour motor car ride of the great western metropolis, Chicago—a course that is said to greatly excel the one over which the Briarcliff was run and which would meet all the requirements of a stock chassis race, in the opinion of those who ought to know and who have witnessed many of the big road events in this country.

First discovered by the Chicago Automobile Club, which has made application for the stock chassis race, the course is located in Lake county, Ind., with Crown Point as the base of operations. It is some 46 miles from Chicago and those who motor there travel over macadam roads that are so good they are known as boulevards. Those who could not go to the race in motor cars will find the railroad transportation facilities excellent, while as for hotel accommodations on the firing line there is Cedar Lake at the front door of Crown Point. Cedar Lake is a summer resort and the lake itself is surrounded by big summer hotels which could house a vast army, with a separate railroad line touching it and bringing Chicago within a couple of hours' ride. The farmers in that section already have become enthused over the prospects of having a national road race in their county and the Chicago Automobile Club scouts have had no difficulty whatever in securing written permission to use the roads for a race of this character. All that remains to do is to get a promise from the governor of Indiana that he will allow the military to guard the course, and already wires are being pulled to get this promise, with good prospects of success, it is said.

Backing up the motorists in this move are the Indiana manufacturers of motor cars who are eager to have the race run in their state. Makers of the Apperson, Haynes, Premier, Overland and others stand ready to support the contest, it is said, and they are using their influence to win the governor.

No Railroads Cross Course

As for the course itself, it has as a strong talking point the fact that it is not crossed by a single railroad and that it touches only two towns, Crown Point and Lowell, both of which are willing to give the motorists the right of way. In going through Crown Point it would be only necessary to skirt the southern end of the town, but in Lowell probably a control would have to be established because the road from Crown Point enters the main street of Lowell between two buildings which are only 25 feet apart. This makes an awkward turn, but which could be easily negotiated if there was a control established.

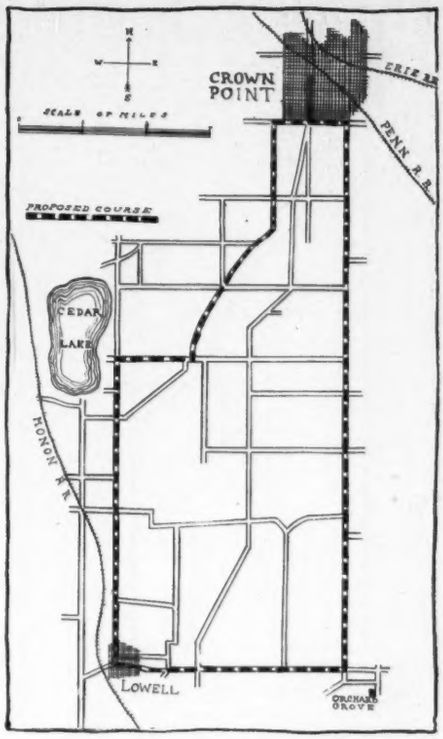
The course is approximately 22 miles in length. It is proposed to start near Crown Point and head for Lowell, 12 miles away. Most of the turns are found between Crown Point and Cedar Lake, 5 miles, which is a stretch made up of picturesque and sinuous turns that would be sporty in their nature. From Cedar Lake there is a 6-mile straightaway to Lowell, then a short leg to the southeastern point of the course in which there is one S turn. The southeastern turn is near Orchard Grove, but once around the corner the contestants will find a 10-mile straightaway to Crown Point.

Description of Course

Those who have been over the course say there are eleven bridges or culverts in the 22 miles. Five of them are stone or concrete and in excellent condition, while the other six are not much more than culverts, none of them having a span of more than 8 feet. It would cost little to put them in condition. As to the con-

PROPOSED INDIANA COURSE—TURN INTO CROWN POINT

SOUTHEAST CORNER OF PROPOSED INDIANA ROAD RACE COURSE



MAP OF PROPOSED INDIANA COURSE

struction of the road, the entire 22 miles is constructed of crushed limestone, with limestone screening for a top, with the exception of a 3-mile stretch on the eastern leg which has been recently completed. That portion is built of crushed cobblestone, with a top dressing of gravel. By spring it will have become thoroughly hardened and packed, so it will be as good as the balance of the course. The highways are all 60 feet wide between fences, the stone portion being 16 feet wide in the center. In a considerable portion of the course the metaling has been spread out so that the pavement is all of 18 feet in width. There are twelve right and left turns on the course.

Prospects For the Glidden

Chicago and the west are not putting all their eggs in the road racing basket, however. They are eagerly looking forward to the 1909 Glidden tour which will start from this city and in anticipation of this event the westerners are trying to help Chairman Hower by looking up the most likely routes. One expedition returned from a long jaunt only last week, when Donald McIntosh, who had been piloting a Studebaker through the west and northwest, reported his discoveries.

The returned scout suggests that from Chicago the tour should go north to Milwaukee by the longest and most difficult route. Northward to Minneapolis and Duluth, returning to St. Paul would uncover some hard roads lined with beautiful scenery, but it seems doubtful if the trip would vary that far from the set path. As a substitute, Milwaukee to Dubuque, a distance of 202 miles, would be a good hard day's work, one-third of the course being over rocky and heartbreaking roads approaching Dubuque. From Dubuque there are two courses, a comparatively easy one except for 20 miles, westward to Waterloo, or a very difficult road southward from Dubuque to Clinton. From either Clinton or Waterloo splendid roads are to be found toward Cedar Rapids and Des Moines, followed by a picturesque tour over rolling prairie westward to Omaha.

From Omaha the roads are "disagreeably good" nearly all the way to Denver, but if the touring committee of the A. A. A. should see its way clear to omit Denver, substituting the Duluth trip it would make a more strenuous test for the high-powered cars. The route southward from St. Paul to Dubuque would try the nerves of many of the old-time travelers.

Whichever way the tourists may be taken, however, they are sure of long days' jaunts to meet hotel accommodations and the tour is likely to prove the greatest test of speed qualifications since the inception of the event. Above all, the people along the way want the Glidden tour, and many clubs have sent in an open expression of ambition to entertain motorists next summer.

"Welcome to Our City"

"Every citizen of the prosperous west is purchasing a 'Welcome' mat to place in front of his well-appointed home during the period of next summer's cross-country jaunt of the Glidden tourists," says McIntosh. "Wherever the Studebaker scouts announced that the Gliddenites are likely to go through the district next July, assurance immediately followed that the travelers would be given as enthusiastic a greeting as has been accorded anywhere during the entire history of the great touring event.

"Of course it is to be expected that owners of hotels, garages, souvenir stores, restaurants and similar revenue-producing industries would look forward to an influx of several hundred prosperous tourists with a considerable degree of enthusiasm, but it is not of this class of western citizen that the returned scouts expect the most enthusiastic greeting when the tour passes along the splendid highways next summer. In fact, it is the farmer of Iowa, Nebraska, Kansas, Wisconsin, Minnesota and Illinois who expresses the most joy over the announcement that a pageant of motor cars may scurry by the prosperous homestead."

TURN INTO MAIN STREET OF CROWN POINT ON INDIANA COURSE

FRENCH SALON A SHOW, NOT AN ART EXHIBIT

PARIS, Nov. 28—With the usual ceremonial, President Fallieres and his suite drove from the Elysée to the grand palace in a motor car, was received by the bowing group of motor car constructors responsible for the exhibition, declared the show open, and spent a couple of hours paying compliments in his hurried visit from stand to stand. It is a morning's formality that must be gone through as religiously as the morning devotions of the most pious Mohammedan, and serves to mark out the salon from any of the common groups of exhibitions where horses or furniture or bric-a-brac are the center of attraction.

Nothing has been changed in the general lines of the exhibition, and to the newcomer it stands forth as a show of remarkable elegance and artistic design; but those who have followed up the increase of decoration, gold paint, flowers and pile carpets, at once miss that flood of electric light and that wealth of decoration that in previous years had caused the unsophisticated woman vistor to ask why they wanted cars there at all when there were so many other pretty things to be seen. Last year it was a gorgeous hall of electricity; this year it is an artistic motor car show. And it is expected that as much business will be done with a good deal less expense to those trying to do the business.

Nearly 700 Exhibitors

There are nearly 700 exhibitors in the large hall on the banks of the Seine, which is a sufficiently high figure to prove that the boycott rumors were nothing more than rumors. The three or four firms that stood out against an annual display have as their only reward the knowledge that nobody misses them. France has more than the lion's share of the show, and naturally takes all the best positions, the locations being made by the drawing of lots with the important feature that only firms of a certain standing can take part in such drawing. The pioneers of the industry get the first positions; those who entered the trade later to make money out of motor cars are given a chance to draw lots according to their business standing. "It would not do to have a general drawing," declare the wise managers, "for then some third-rate firm might get the center position and be unable to put up a stand that would harmonize with the decorations of the hall."

But the foreigners have not much reason to grumble at their positions, for near the center of the hall, and round the foot of the grand staircase are grouped the gorgeous stands of Mercedes, Fiat, Benz, Minerva, Lancia, Wolseley and Buick. The only other American motor car constructor to hold a position in the salon is Ford, with a stand less centrally placed. In the gallery, where tires and a thousand accessories have been given lodging room, Rushmore and Splitdorf are the two most important representatives from across the Atlantic. On the opening morning the American visitors observed around the hall were D. J. Post, of Post & Lester, Hartford, Conn.; Howard E. Coffin, of the Chalmers-Detroit company; Emil Grossman, president of the Motor Car Equipment Co.; Russell Huff and H. D. Wilson, of the Packard Motor Car Co., and John L. Poole, representing the Buick interests. Those reported on the way are J. D. Maxwell, of the Maxwell-Briscoe Motor Car Co., and Roy Chapin.

Low-Powered Cars Popular

There are a few points in which the tendency of European design is noticeable from even the cursory examination of an opening day visit. Lower-powered cars are everywhere in favor. With but an exception here and there, every constructor who has made a name in the big car class has gone into the small car field, the idea of a small car varying from a four-cylinder of 35 millimeters bore to a one-lunger of 100 millimeters. Without exception they are shaft-driven; where the cylinders are four in number they are, in nine cases out of ten, cast in a single block, with valves on one side. Ignition is invariably by high-tension magneto only; water circulation in most cases is by thermo-syphon, with a tendency to put the radiator on the dash—Renault fashion—when new models have been designed. On clutches and transmission there are a variety of designs; on suspension the prevailing mode is semi-elliptics in front, three-quarter-elliptics in the rear, with a good deal of variety in the way the rear springs are designed.

Low-tension ignition has received its death blow. During an early morning run through the show not a single example of low-tension make-and-break could be found. It is true that a few of the cars had not got the covers off, for the president had not arrived and the doors had not been flung open to the public; but even among those hidden were only a few of the very large models that had the simple low-tension magneto. Among the firms having changed some or all of their models from low to high-tension ignition are: Brasier, Dietrich, Mercedes, Mors, Itala, Berliet and Fiat. Double ignition is very rarely seen, and in many cases no provision has been made on the engine for adding a second system as a standby.

There are very few distinct departures from generally accepted standards of design, though of course plenty of diversity in detail methods of working out every part of the car. Air-cooling has one representative only, and even that one is not brought forth as a commercial proposition. The Henriot is an inventor's idea, and has its four cylinders with deep flanges cooled by a couple of fans placed on the right-hand side of the engine and driven by bevel gear and upright spindle off the camshaft. The transmission is a planetary one, contained within the flywheel. Another idea of the same firm was the substitution of the radiator by a dashboard tank into which a current of air was forced, circulation being by thermo-syphon.

Knight's Engine a Sensation

Charles Y. Knight's patent, as modified by Panhard, Minerva and the English Daimler, undoubtely was the most attractive mechanical feature of the show, without, however, being the one that met with most praise. There are plenty of critics to point out that the engine is difficult to lubricate; that equal silence can be had with a poppet type of valve, and that its good points are obtained at the cost of complication.

Six-cylinder cars stand just where they were; there are a few new models, but there are some that have disappeared, and there are certain firms having found so little demand for this type of engine that they do not give it standing room this year. Single cylinders, on the other hand, are being brought forward more and more prominently. In the majority of cases the engine is a de Dion or an Aster fitted to the builder's own chassis, though there are a few cases of large, influential firms having produced a mono, the most important being Bayard-Clement. The aim of the French constructor is to make his one-lunger look like a four-cylinder car, and with this object in view he carries his single vertical cylinder forward under a bonnet that would easily accommodate a four in two castings. In this particular feature the designer has succeeded, for it is impossible to say, from a mere outside examination, whether there are one or four power-producing units. To complete the illusion it is necessary that the exhaust should have the right sound, and though a few have cut down the noise to such an extent that the layman may be deceived, the space, clap, clap, clap generally betrays.

The larger firms prefer the two-cylinder model for their smallest powers, and here are to be found Panhard, Renault, Darracq, Dietrich, Brasier, Charron, Berliet and Bayard-Clement with two-cylinder vertical engines that in most cases can be run side by side with a four without any but an expert being able to tell, from the noise only, which is which.

Big Makers Out of Grand Prix?

Paris, Nov. 28—There is report abroad in well-informed circles that four of the most important firms have agreed among themselves not to compete in the next grand prix. The matter would not be so very extraordinary were it not for the fact that the firms in question, which are declared to comprise Brasier, Renault,

Panhard and Dietrich, each has a representative on the racing board and are therefore boycotting their own event. Just how much truth there is in the report it is impossible to say; but there is no doubt whatever that these firms have discussed among themselves the advisability of abstaining from racing next year. Paris is more than surprised at the move, and bluntly declares that the crack constructors have got cold feet at the idea of second rate firms, having had long experience in the construction of small cars, coming forward and beating them at their own game. They could stand being beaten by Fiat and Mercedes, but when it is a question of Blank & Blank, voiturette builders, coming forth with a special 130-millimeter bore racer and beating them, they would prefer to keep out of the game. Undoubtedly next year a number of firms having never before tackled a special racer, will come forth with a grand prix car. There are at least half a dozen having specialized in 120 and 130-millimeter bore touring cars who will use the knowledge gained in this line to build a trio of racers. Berliet, the winner of the Italian 130-millimeter race, will enter three cars for the first time in the French grand prix, the driver of one of them, in all probability, being Thery. The engines are already under construction, and are declared to have a stroke of 200 millimeters.

HOUPT TO SELL HERRESHOFFS

New York, Dec. 7—Looking over the situation for 1909 develops new surprises every time the task is performed. The latest bit of information that should prove of more than passing interest to the supporters of the industry lies in the consummation of the deal by which Harry S. Houpt has taken over the entire output of the Herreshoff Motor Co., of Detroit, for the coming year. The work of the Herreshoff company, at Detroit, will be devoted to the filling of eastern orders during 1909, rather with the hope that in a year the capacity of the plant will be increased sufficiently to catch up to the general demand. The Herreshoff will be shaft-drive with a four-cylinder engine, water-cooled, four-cycle and a self-contained power plant. The three-point suspension will be embodied, and the transmission will be progressive, three speeds and reverse. The Herreshoff idea is that simplicity and the elimination of a multiplicity of small parts in and about the gearset follow the adaptation of the progressive type of gear. The main attraction in the Herreshoff will be the motor, of the Herreshoff design, in which the speed possibilities lie between 200 and 2,400 revolutions per minute in actual service. It is rated at 24-horsepower. A double system of ignition including a Bosch magneto will be used. The car will be on exhibition on or about January 1, though it is to be noted that it is Harry S. Houpt who takes on the Herreshoff—not the Harry S. Houpt Co.

PLAN OF PALACE SHOW

Elaborate Color and Decoration Scheme Adopted for First of the Big Exhibitions

New York, Dec. 6—Thousands of electric lights, oil paintings, bevel glass mirrors, tropical gardens, statues, streamers, grouped flags of each nation represented in the exhibits, powerful searchlights, and blending of harmonious colors, will be used in the decoration plans of the Grand Central palace show next month. Not only will the interior of the palace be decorated, but the exterior will be given more than ordinary attention by the artists, while the main lobby and stairways leading to the main court will be given special attention by the artists and sculptors.

The present public entrance on Lexington avenue is to be made into an attractive porte cochere, with massive statuary of Egyptian design supporting electric signs which will flash out a welcome to the show. Electric searchlights at the entrances will be arranged so as to be seen at a great distance and two other signs, 18 feet in width, will cover the rear wall. Surmounting the two columns will be a classic balustrade with large urns filled with evergreens lending their scenic effect to a huge oil painting representing an onrushing motor car that is leaving a flaming comet-like trail of dust and light in its wake. Inside, the vestibule will be artistically draped with flags of all nations and large urns, while at the stairway approach will be two life-size female figures resting on an eagle supporting a wheel. They are finished in verdi antique, which is another name for copperish green. The entire ceiling of the entrance hall leading to the main stairway will be canopied in silk with streams of electric light radiating from the center.

The main auditorium hall or court of honor, will be treated in early English style. The balconies are partially hidden by red orange colored tiling, which will extend some 3 feet outwards over the main halls, while carried down to a level and meeting the tops of the present capitols of the hall, will be a frieze of scenes depicting automobile races and contests, including the Glidden tour, the Vanderbilt cup race, and the Savannah road race. The main auditorium will have its ceiling covered with a fabric, atmospheric blue in color, which combined with lattice work, boxes, and urns of flowers and growing plants, will give to the gallery a hanging garden effect. At the end of the hall now occupied as a part of the stage, a real garden will be formed of bay trees, evergreen and flowers, together with a number of singing birds hung in gilded cages.

To divide the garden from the general exhibition hall, the show committee has selected a piece of statuary some 15 feet in length and 5 or 6 feet high, with life-sized allegorical figures representing "Wisdom Instructing Youth in the Mysteries of Motor Car Construction." In addition ten statues of original composition and heroic size representing "The Spirit of Speed" are to stand on the balcony rails upholding garlands of flowers and streamers of electric light, which will lead to a circular ball, a sunburst of light in the center of the hall.

For the general decoration of the palace, the prevailing tone will be white and gold, with festoonings of Berlin green, while for the floor covering, 8,500 yards of a specially-woven bronze-colored fabric will be used, instead of the denim usually employed in exhibitions of this character. The tables, counters, railing and furniture will be a rich dark green in color, while the signs displaying the names of each car or exhibitor, will be of white with gold letters and moulding and green shading. This will be made of compoboard instead of oilcloth, while the accessory people will have, in addition, special silk gold-fringed banners suspended from a standard in their booths.

GARDEN WILL STAY

New York, Dec. 7—Talk of Madison Square garden being sold and torn down appears to be somewhat premature and perhaps misleading. Although it has been advertised as for sale, it would now seem from information gleaned from near headquarters that the agitation has been due to certain manipulative plans of the management. J. Pierpont Morgan, the biggest stockholder, has said recently with much explicitness that the garden will not be torn down. The management of the big shows that visit the garden annually are not at all anxious. The horse show managers have said that their show will be held next year as usual and Colonel George Pope, chairman of the show committee of the Association of Licensed Automobile Manufacturers, says: "There is no apprehension about the motor car show having to abandon Madison Square garden as its home. The ninth national show of the licensed makers is to be held there January 16-23, and the association has a lease that calls for a motor car show to be held there next winter, too."

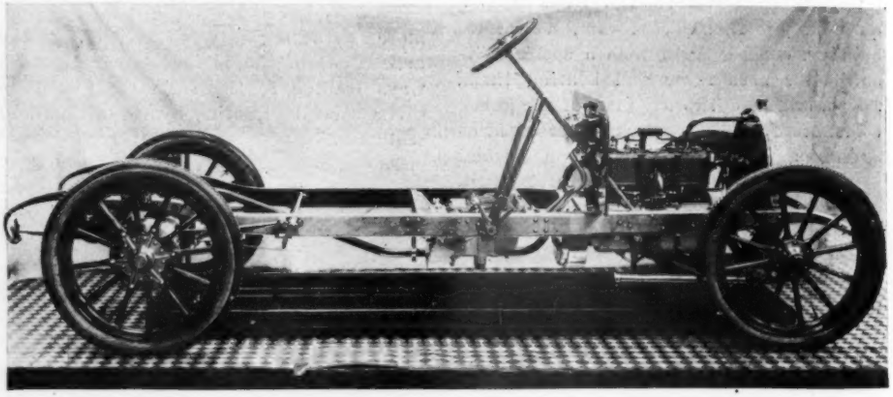
ANOTHER POPE PLANT SOLD

Hartford, Conn., Dec. 7—The Thompsonville plant of the Pope Mfg. Co., which has been occupied by a tobacco firm for some time past has been sold to the Hartford Carpet Corporation of that town. The present tenant is to vacate the property January 1. The property was listed in the Pope assets at $10,000, though it cost nearer $30,000 when ready for occupancy. The United States district court at Baltimore, Md., has ratified the sale by the receivers of the Hagerstown Pope plant for $57,500.

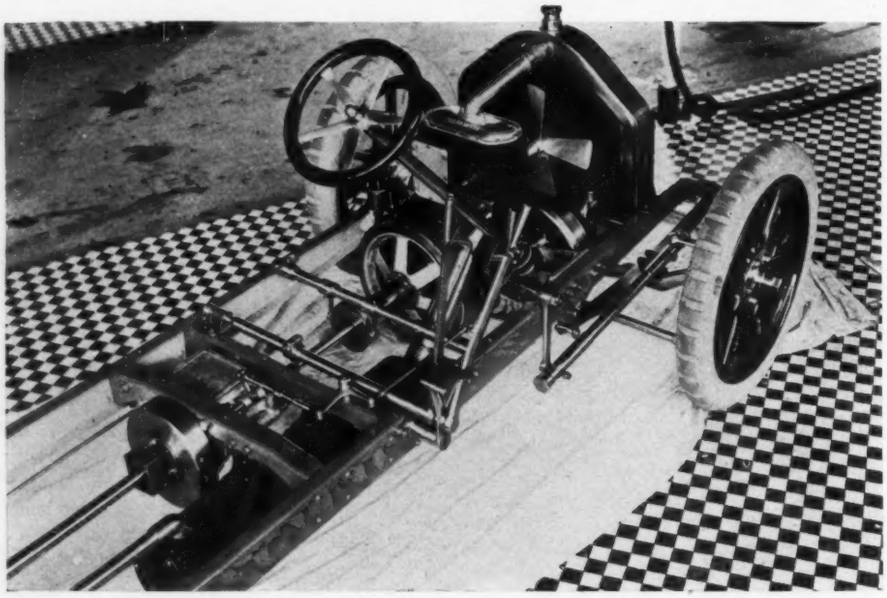
SMALL CARS FEATURED AT OLYMPIA SHOW

Double Ignition, Thermo-Syphon Cooling and Selective Gear Sets Are Characteristics

LONDON, Nov. 30—No visitor could be a daily attendant at the Olympia show without having impressed upon him the vast strides made during the year just closing and the advancement of the small four-cylinder car of 16 to 18 horsepower, also the phenomenal trend of manufacturers towards the two-cylinder type of machine and the apparent neglect the single-cylinder car has been subjected to in the past 12 months. A year ago it was all single cylinder for small cars; today it is two and four-cylinder propositions. While this shows the general trend, it is most surprising the amount of workmanship that has been bestowed upon many of the small cars, and these, when looked upon with the closest scrutiny, are in reality miniature machines, incorporating in their make-up the majority of the fine points of construction seen in their larger brothers. As examples of this it will serve to cite the case of the 7-horsepower Adler, on which a dual system of ignition is fitted, consisting of the looked-for magneto as well as the accumulator outfit. In the 9 and 12-horsepower Riley cars a Bosch magneto is attached in addition to the accumulator supply. The engine in this little car varies from those in the majority of small machines by employing a two-cylinder engine with cylinders mounted V-form, similar to that employed on air-cooled Marmon machines. This car is a good example of those carrying the entire weight well between the front and rear axles.



ONE OF THE SMALL FOUR-CYLINDER HOTCHKISS CARS



VALVELESS ENGINE, A TWO-CYCLE PROPOSITION AT THE SHOW

Four-Speed Gearset

The 8-horsepower Chenard-Walcker car deviates somewhat from conventional construction by employing a selective gearset giving four forward variations in speed. To many this may appear an unnecessary complication of the gearbox, but the manufacturer undoubtedly is possessed of the thought that, with limited motor power, increased flexibility in the transmission is desirable, which has been obtained by fitting the four speeds in the gearset. A further evidence of how the transmission problem has been on the mind of this designer is evidenced by the use of a double rear axle of the stationary and live type, and not unlike that employed on DeLuxe cars in America, and, if I understand aright, to be used on some of the shaft-driven Stearns machines during the 1909 season. This axle is a modification of the original de Dion, with a stationary part supporting the entire load and a rotating part whose sole duty is that of propulsion. In conjunction with this rear axle is the employment of three-quarter elliptic springs.

Another interesting two-cylinder small car is the Smeddle-Kennedy, in which the vertical cylinders are cast in one, and valves located in their heads, open through an overhead camshaft, driven by double gearing from the crankshaft. Use is made of a transverse front spring; a Nieuport magneto is used in conjunction with the motor, two sets of expanding brakes are fitted side by side on the rear wheels and the gearbox is incorporated with the live rear axle.

The two-cylinder Humber with an 8 horsepower motor is one of the really small cars of the show, but, in spite of its size, has a double ignition system, the major part of which is a Simms magneto. This little car uses thermo-syphon circulation, has a multiple-disk clutch operating in oil and uses a three-speed gearset.

Two Single-Cylinder Types

Of the small foreign cars, the Delages and Werners are examples of the single-cylinder design, both employing de Dion motors. In the carbureter employed a single jet is used about which the air enters through a venturi tube orifice, and above the piston's throttle is an entrance for auxiliary air. At the Werner stand are 6 and 9-horsepower types, the general design of both being the same. In both a Bosch magneto is employed and the engine is cooled by the thermo-syphon principle. The clutch is of the internal leather-faced cone type, the gearbox gives three variations of speed with direct drive on the high, while final transmission is by shaft. The usual three-quarter elliptic springs are in place in rear, the front axle is an I-beam section, and in the majority of respects the little car, excepting of the motor, is a duplicate of the larger types.

A Two-Cycle Example

One of the cars at the show that daily has come in for the lion's share of examination and criticism is the Valveless, with its two-cylinder engine set crosswise in front of the car and having a common combustion chamber for both cylinders. The motor has two crankshafts which are parallel with themselves as well as with

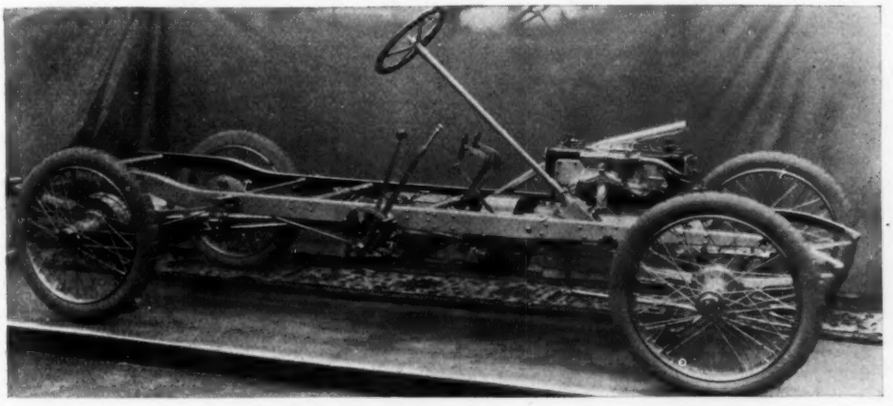
the side members of the frame, and attached to each is a gear wheel so meshed with each other that the pistons travel up and down together. In the cycle of operations, air is drawn into the crankcase on the upstroke of the pistons, past the diaphragm, which when lifted by the pressure allows gasoline to pass through a jet so that the greater the speed of the engine the greater the air pressure, and the more gasoline allowed. On the downstroke of the piston the air is drawn and forced past a non-return valve, where it picks up the gasoline, which the jet has passed and passes into a cylinder through a port, uncovered by the piston when at the bottom of the stroke. The fresh mixtures when passing into the cylinders under pressure from the crankcase expel the exhaust gas of the previous stroke and the fresh mixture is compressed on the next upward stroke of the piston. The compressed charge is fired on the next down stroke, so that there is an impulse every revolution. On a cross shaft in front of the motor are the magneto, oil pump and water pump. One of the crankshafts carries the flywheel in front, the other in rear, the rear one transmitting through a cone clutch to a three-speed gearset and thence by shaft to the rear axle. A common head plate serves as a water-jacket cover for both cylinders.

Rear Axle Gearbox

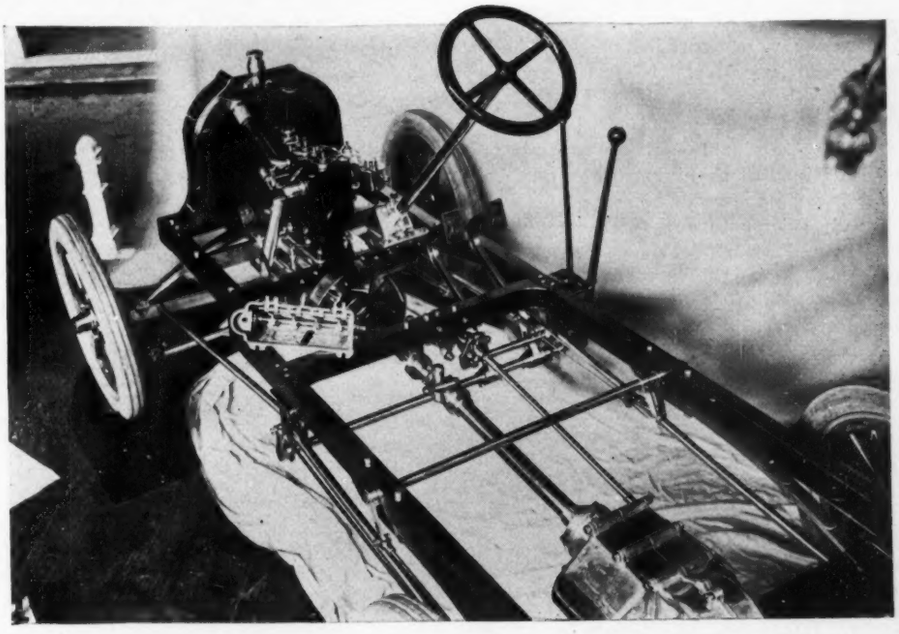
Of the large cars, one of the most interesting is the six-cylinder Sheffield-Simplex, in which the transmission set is incorporated in conjunction with the differentials on the live rear axle, a custom which is rapidly gaining ground in Europe, and which has a considerable following in America. Of interest in conjunction with the motor is the fact that the magneto can be adjusted without altering the position of the teeth of the gear wheels on the driving spindle, which is accomplished by the coupling which connects it with the spindle. On the end of the magneto spindle is a crank which connects with the coupling by a bolt passing through a slot in the coupling, the slot following the arc of a circle, and so permitting any adjustment of the magneto armature position through the medium of this slot. The high-tension wiring on this car is a single insulated high-tension cable.

Uses Wire Road Wheels

Of paramount interest in the show is the 18-horsepower Thornycroft with its four cylinders cast in one, its wire road wheels and its frame well arched above the rear axle. The chassis of this car is almost a duplicate of the Tourist trophy car, excepting for the cylinders forming one casting. Thermo-syphon cooling is used, the three-speed gearset is suspended through a three-point support, and shaft-drive is used.



THORNYCROFT, 18-HORSEPOWER, DUPLICATE OF 4-INCH RACE TYPE



TWO-CYLINDER SMEDDLE-KENNEDY, AN INTERESTING TYPE

The 11 and 16-horsepower Hotchkiss cars have cylinders cast in pairs, with valves on the left side, and the crankshaft mounted on three frame bearings, and inserted in the one-piece crankcase endwise through the fitting of divided end plates for the crankcase. On the right side of the frame is a hand wheel for cutting off the flow of gasoline to the carbureter, and Eisemann high-tension ignition outfit is fitted, and the adjustment of the fan belt is by a set screw passing vertically through the squared end of the spindle carrying the shaft. This set screw is locked by splitting the brackets supporting it. Other new ideas are seen.

NEW PRINCE HENRY FORMULA

Berlin, Dec. 28—In a conference at the Imperial Automobile Club, Berlin, between the club and the industry, the regulations governing next year's contest were worked out and will be published in full during December. Of these the most important is the formula accepted by the meeting, in order to eliminate freak and racing vehicles as much as possible from the competition and give the normal touring car the chance it certainly did not enjoy in the first tour. The formula is as follows:

$$N = 0.013.\ i.\ d^2 \sqrt[3]{s^2}$$

N being the horsepower, i the number of cylinders, d the bore in centimeters, and s the hub in centimeters. Besides this, all drivers, who have neither won a cash nor art prize for themselves or the car owner in any recognized contest, club arrangements excepted, will be credited with a certain number of points, in order to give them a more equal footing with professional drivers; this will, however, only have a bearing on the whole result, and the speed trials on the flat on the first and last days will be excluded. The minimum weight for the weakest cars, with a capacity of 1.6 litres, is 750 kilogrammes, with a further kilogramme for each one-tenth of a litre more. The weight of the body may be less than 15 per cent of the whole. At the same meeting it was decided to turn the proposed voiturette competition into an international event, only factories being allowed to enter with teams of three cars each. The date was fixed for August 29 to September 2.

Published Weekly
The Class Journal Company
1200 Michigan Avenue, Chicago
New York Office, 239 West 39th Street

MOTOR AGE

Subscription Rates
United States and Mexico, per year, $3.00 Other countries including Canada, $5.00

Entered as Second-Class Matter September 19, 1899 at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

Vicissitudes in Car Ranks

THIRTEEN or more exhibitors of motor cars, who decorated one or more of the three big shows last year with their car products, will be missing from the show circuit which will open in New York on New Year's eve and in Chicago on February 13. Practically all of these have fallen by the wayside, some of them having taken the usual exit route by way of receivership and creditor's sale; others, having seen the impossibility of continuing in the fierce light of 1909 competition, decided to cast their lot with larger makers and dropped entirely out of existence. But, while this number has dropped from the zone of motoring activities, an array equally as strong numerically has entered the breach.

★ ★ ★

IN LOOKING over the ranks of those concerns that have fallen by the wayside many deductions, which have a potent bearing on the future of the industry, have been arrived at. In not a few cases the concerns who have dropped from existence have done so because of semi-freakish constructions, the makers exhausting all their energies in arguments trying to convince the great buying public of the feasibility of certain novel and quite irregular constructions. Some of the constructions have possessed a moiety of merit; others have been but hallucinations of an egotistic promoter or mechanician. In either case vast sums of money were expended, but thanks to the good judgment of the great American public, they were rejected, and the industry is today better, because of the demise of them. The evolution of the American motor car industry has had many examples of this individual egotism wanting to predominate a factory output instead of giving place and being tempered with what has become known to be sound engineering principles. It means certain suicide to any factory that pins its entire existence on the whims of one promoter who may have a 51 percent interest in the organization. A cursory resume of the names of those who "have been" will be sufficient to show why they have ceased to be, as well as demonstrating the value that these have been to the industry, by exploiting constructions that will surely not be resurrected for some time.

★ ★ ★

IT IS refreshing in looking over the list of thirteen or more newcomers to find that they have not wandered aimlessly through the land of novelty in search of something that would be diametrically opposite to present day construction; rather, the majority of them show sober mindedness in every respect. Not a few of them have not aimed at anything new but have endeavored to manufacture a well-made proposition at a slightly lower cost than competitors by building in larger quantities. Several of the new concerns, instead of designing rear axles and transmissions of their own, have accepted the tried construction of concerns engaged in the manufacture of these.

★ ★ ★

ONE more interesting phase obtained from a survey of the newcomer ranks is the wholesouled spirit with which many of them have entered the industry. In many cases the concerns do not intend to start building on a 50 or 75 car basis, but have matured plans for an output of 500 cars and upwards. The money invested in these concerns comes from capitalists who have been following the motoring industry closely for a couple of years, and it is a safe prediction to make that several of the new cars will not prove mushroom growths of the year, but will take their place in the permanent field.

Europe's 1908 Small Cars

THE small car fever which originated in Europe a couple of years ago, and which developed rapidly since then, has continued this development beyond the fondest expectations of the little car admirers, and 1909 can be looked upon as the banner year for small cars, in that scarcely a maker of big cars but includes one or two small sizes ranging in horsepower from 9 to 18, in his 1909 line. The small car abroad has been popularized by various means: On the continent, the various voiturette races have been great incentives to the builders; and, in England and Scotland the commercial depression which has gone over the country for the past 12 months has made it imperative for many of the large makers to increase their purchasing clientele by enlarging their line, to embrace the small two-passenger car.

★ ★ ★

BUT the European small car has passed through several stages of evolution in the last 12 months. Particularly is this so in England, which has just emerged from its annual Olympia show, in which every booth contained its small car chassis. A year ago in these booths the small car was a single-cylinder proposition of the vertical type. Today, two-cylinder and four-cylinder types predominate. The two-cylinder styles are of the vertical type, and where four cylinders are employed the general custom is to cast them in one, and, to further simplify the manufacture there is a growing tendency to form the upper half of the crankcase integrally with the walls of the cylinder. A most impressive detail with the majority of these little cars, is the close attention paid to ignition, the majority of them boasting of a double set, one of which is a gear-driven magneto, the other a storage battery and coil arrangement.

★ ★ ★

IN FRANCE, if it is proper to deduce from the French exhibits seen at Olympia, the single-cylinder motor retains the premier position it occupied last season, a fact which is undoubtedly explained by the remarkable success obtained by several French motors of this type in recent road races. These little motors, however, vie with their rivals across the channel in the employment of double ignition outfits, thermo-syphon circulation and positive lubrication.

★ ★ ★

WITH all of the small cars the sliding and selective gearset predominates, the majority of makers preferring to employ three forward speeds and reduce the cylinder size than using a two-speed gearset coupled to a larger motor. The high price of gasoline has been a potent factor in determining this characteristic construction. The makers must be credited with sound reasoning, in their employment of several speed variations in connection with a low-powered motor, and, in order to make up for the limited horsepower one or two of the builders have installed selective gearsets with four forward speeds. Not alone have the motor and gearbox been worked upon, but the running gear has materially benefited. I-beam front axles are everywhere in evidence; pressed steel frames arched above the rear axle or dropped in front of it, are general. The transverse front spring is receiving attention; three-quarter rear springs are popular; and a commendable feature in the majority of cars is the aim to carry all of the weight between the axles. It is not uncommon to see all of the brakes operating on rear wheel drums, one set expanding within the drum, the other contracting on it, and in three or four cases both sets are of the expansion type.

A. L. A. M. ANSWERS IMPORTERS' ARGUMENT

NEW YORK, Dec. 7—"The importers of foreign motor cars must surely feel that they were exposed to ridicule by the absurd statements of their representative before the ways and means committee Friday, November 27," is the reply of E. P. Chalfant, the general manager of the Association of Licensed Automobile Manufacturers, when interviewed concerning the representations made by Charles H. Sherrill in behalf of the importers' salon, who asked for a reduction in duty from 45 per cent to 30 per cent ad valorem. "Mr. Sherrill appeared badly rattled by the interruptions and rapid-fire questions to which he was repeatedly exposed, and was probably hurried into erroneous and contradictory statements upon unfamiliar subjects not included in his prepared brief. The public probably will compare the accuracy of his general remarks with the one that 'George H. Day is the general manager of the licensed association and has been for a long time.' In fact Mr. Day has been dead for over a year, and resigned several months earlier.

Denies Exorbitant Profits

"American motor car manufacturers have not made exorbitant profits, and a relatively small number of them have made profits at all. The manufacture of motor cars first began to assume the proportions of an important industry in 1902: Following is a table of the vital statistics of the trade:

IN 1902	
Concerns in business	51
Discontinued that year	18
Concerns carried over into 1903	33
IN 1903	
New concerns started up	71
Discontinued the same year	30
Concerns carried over into 1904	41
IN 1904	
New concerns started	54
Discontinued	40
Concerns carried over into 1905	14
IN 1905	
New concerns	51
Discontinued that year	38
Carried over into 1906	13
IN 1906	
New concerns	43
Discontinued that year	29
Carried over into 1907	14
IN 1907	
New concerns	51

"Of the fifty-one concerns in business in 1902 only twenty-one survive and are in business today. The foregoing picture of the vicissitudes of individual concerns is keenly and understandingly appreciated by manufacturers, who themselves recognize the uncertainty of prolonged success. History shows with remarkable reiteration the failure of concerns which have been temporarily successful. The foregoing record shows:

	Concerns
In business in 1902	51
Started from 1902 to 1906 inclusive	270
Total	321
Discontinued during 5 years	155
In business December 31, 1906	166

General Manager Chalfant Delves Into Statistics to Prove Need of a Protective Tariff

"There are now listed 253 makers of motor cars in this country, of whom about 100 are turning out cars in fair quantity. It is safe to say that not 10 per cent of the American motor car manufacturers are making money. A great deal of the manufacturers' money goes for experimentation. The large amount of capital required and the character of the business eat into the profit of the business very materially. Clearly the industry deserves proper protection from the normal production and the overproduction of the European factories, with their cheap labor, low rate of taxes, and preferential rates on manufacturing machinery. In this country the cost of labor is two and one-half times what it is abroad. Materials abroad are cheaper, ground rent is less, the cost of living is less, the industry is taxed less, and all machinery imported for use in a new industry is admitted duty free or at a preferential tariff.

"When making the statement that 90 per cent of the imported cars arrived in the shape of the naked chassis, it was apparently forgotten that just a little more than 40 per cent of the cars imported during the last 12 months were complete with bodies, and that bodies for the remaining 60 per cent—by no means all of them minus bodies—would not keep busy for more than a portion of the year even one of the two carriage makers whom Mr. Sherrill mentions as having been kept alive by the business of the importers, whereas all the carriage makers outside the metropolitan district probably do not collectively get a dozen bodies to manufacture in a year for imported cars.

"Tariff rates must afford ample protection to American-made goods, and provide a customs duty on imports equal to the difference in cost of production here and abroad. It is needless to say that the statement that the Association of Licensed Automobile Manufacturers is a 'trust' is absurd. This association, whose members conduct a strictly competitive business, is the most important thing in the country for the industry of motor vehicle building, for the dealer in motor cars and for the persons who purchase them. In a word, in 1903, certain representative motor car makers agreed to recognize the validity of the Selden patent and pay license fees thereon. In these days of strenuous and sometimes unfair competition it is refreshing to find that a friendly and co-operative spirit exists and a frank discussion of business proceedings taking place among men engaged in the same industry.

"The Association of Licensed Automobile Manufacturers was organized for mutual protection, and the benefit of the industry. The first appears in a joint study of the tactics of outside concerns and in the prosecution of competitors who are thought to be infringing any of the rights of the association. This is accomplished without in the slightest degree interfering with the right of any association member to build in any way he chooses and to sell at any price he thinks best. The association is in no sense a trust. It looks after its own interest only within its own bounds and in no way interferes with the separately conducted competitive business of its constituent members.

A. L. A. M. Not a Trust

"It is public knowledge that in this organization a large number of the principal companies in the industry have associated themselves in a most creditable, equitable and legal manner, and at the same time in a way that can bring about the advantages of general economy. It seems to me that the great work is obvious which the association has done and is doing in conserving the interests of the industry, in improving the condition of the field and in protecting the producers, sellers and buyers of motor cars.

"Speaking advisedly for both the A. L. A. M. and the A. M. C. M. A., there is no trade agreement in the American motor car business regulating the price of machines. Each manufacturer is unrestrained and free to regulate his own prices, and does so. The division between the classes of manufacturers relates solely to the payment or non-payment of royalties under the Selden patent. The other regulations refer to questions of publicity, the dissemination of trade information and the standardization of manufacture."

Dates of the Shows

Palace Show—Ninth international show, conducted by the American Motor Car Manufacturers' Association with the Importers' Automobile Salon and the Motor and Accessory Manufacturers, Grand Central palace, New York, December 31 to January 7.

Garden Show—Ninth annual show of Association of Licensed Automobile Manufacturers, Madison Square garden, New York, January 16-23.

Philadelphia Show—Annual show of Philadelphia Automobile Show Association, Second Regiment Armory, Philadelphia, week of January 27-February 3; J. H. Beck, Odd Fellows Temple, manager.

Chicago Show—Annual N. A. A. M. show in Chicago, February 6-13.

Cleveland Show—Show of Cleveland Automobile Dealers' Company, in Cleveland, February 15-20.

Detroit D. A. D. A. Show—Second annual show of Detroit Automobile Dealers' Association, Wayne pavilion, February 15-20.

St. Louis Show—Annual motor car show in St. Louis, February 15-20.

Denver Show—First annual show of Denver Motor Club, Auditorium, Denver, Colo., February 16, 17, 18.

Hartford Show—Hartford Automobile Dealers' Association's annual show at Hartford, Conn., February 27-March 6.

Boston Show—Annual Boston show, week of March 6-13.

Pittsburg Show—Annual show of Pittsburg Automobile Dealers' Association in Duquesne garden, March 27-April 3.

HEARING ON MOTOR CAR TARIFF POSTPONED

WASHINGTON, D. C., Dec. 7—Contrary to expectations the hearing of certain motor car manufacturers before the ways and means committee of congress, scheduled for today, did not materialize. A number of men prominent in the trade, including L. H. Kittredge, of the Peerless Motor Car Co.; Benjamin Briscoe, of the Maxwell-Briscoe company; James M. Carples, Alfred Reeves and others, held a meeting in this city Sunday evening and went over the situation very thoroughly. Recognizing the fact that they did not have at this time sufficient data at their command to lay before the committee, it was decided to ask the committee for an extension of time in which to file an elaborate brief and also to make an oral statement before the committee. When Chairman Payne called upon Benjamin Briscoe this morning, the latter stated the situation to the committee and asked for 2 weeks' time in which to prepare the brief. The request was granted, Chairman Payne stating that the earlier the brief was filed the better it would be for the interests represented.

It was understood that the motor car importers would again be heard by the committee this morning, but none of them appeared and it is likely that any further arguments they wish to make will have to be submitted in the shape of a brief.

Brief by Henry B. Joy

Henry B. Joy, chairman of the motor car manufacturers' tariff commission, has submitted a brief, from which the following excerpts are of interest:

We represent the motor car industry of America in the following manner: There are three main trade associations in the United States, as follows: The A. L. A. M., the American Motor Car Manufacturers' Association and the National Association of Automobile Manufacturers, and are represented before your committee by H. B. Joy, Packard Motor Car Co., Detroit; A. L. Riker, Locomobile Co., Bridgeport; L. H. Kittredge, Peerless Motor Car Co., Cleveland; C. H. Stillwell, H. H. Franklin Mfg. Co., Syracuse; E. R. Thomas, Buffalo; R. E. Olds, Lansing, and Thomas Henderson, Winton Motor Car Co., Cleveland.

In order that your committee may understand more the importance of the representations which the above committees representing the American industry will lay before you, I wish briefly to state the importance of American commerce of the companies directly represented as above by stating that the market value of the products of those manufacturers above mentioned for the current fiscal year will exceed $37,500,000. These companies represent on their pay rolls today 11,400 employes directly paid by them and at work within the four walls of the respective companies. That is not taking into consideration the number of employes directly engaged in work being done for these companies outside of their own factories, nor does it take into consideration the millions and millions of dollars' worth of material being purchased by these companies from American sources of supply. A further matter of interest might be that the direct aggregate of pay rolls of the companies represented by the above mentioned gentlemen is approximately $700,000 per month paid to American workmen. I merely state these facts as indicative of the importance to be attached by the committee to our industry, and these statistics refer only to the companies of those gentlemen mentioned above.

The extent of the motor car industry at the present time is 253 manufacturers of motor vehicles, of which about seventy to 100 are marketing a product that is of importance to the trade. The value of the total American product for the year 1907 we place according to our best figures at upward of $100,000,000. The motor car industry is in process of rapid development, as witnessed by the fact that this enormous industry has grown up in America in the past 10 years. Motor cars for import now come under the Dingley tariff law, schedule C, paragraph 193, act of 1897—manufactures of metal, n. s. p. f.

Urges Special Classification

We specially and earnestly urge upon your committee a special separate classification for motor vehicles and parts thereof, on account of the extent and importance of the motor car industry, which did not exist when the Dingley tariff law was enacted. It is essential that equitable and adequate tariff protection for our product be provided, owing to the existing conditions in Europe, where very large factories have already more than supplied the European demand and which now finds the foreign market overcrowded, and on account of this overproduction are making strenuous efforts to market their excess product in America by the reduction of prices for exportation and making special discounts, availing themselves of the so-called "German concessions." The tariff necessarily, in order to be a protection, must compensate for the difference in the cost of production in this country and Europe, the principal item of which is wages.

It is to be specially noted that under the existing tariff the volume of imports of motor cars has annually increased, though statistics show that the value has decreased yearly on account of reduced prices abroad and American competition, yet the number of cars imported has increased each year, and we wish to call particularly to the attention of your committee the strenuous efforts on the part of various manufacturers to introduce their goods into the American market—racing, advertising, branch houses.

Reduction in prices, undervaluations, special discounts and every means which can be devised are being, and will be, used to unload on the American market the excess product of Europe produced on the low European wage basis. The only means left to the American manufacturer to offset a reduction of the tariff and increased imports is reduction of wages, contests with our employes, and all the attendant tribulations, which is what we are seeking to avoid.

Further, it is clear that if the tariff were to be reduced on motor cars, making in any degree the importation of them more easy, it would necessarily follow that the tariff on component materials comprising tremendous varieties of industries in this country would also have to be reduced.

It is our desire to present to the committee any information which it may ask which will throw light on the existing conditions and be a guide in determining a wise measure of protection. We have here some brief, salient data which we wish specially to bring out. The astonishing difference in wages between Europe and America is beyond controversy and exists to a degree which we wish to impress upon the records of your committee.

We have compiled for your committee the following information. In eight of the leading and important American factories, employing 11,400 men, the average pay per year per person is as follows: Workmen, $755.05; commercial employes, $876.07; technical employes, $1,202.41. We have also the data covering the same information giving an average of 34 factories in Europe, employing 10,347 men. The average pay per year per person is: Workmen, $306; technical employes, $602.50; commercial employes, $529; showing that the workmen in American factories are paid 2½ times approximately what they get for the same work in the same kind of factories in Europe. Technical employes in the American factories receive approximately twice what they do in Europe, and commercial employes receive about 2¼ times what they do in Europe. As a check on these figures compiled by our home factories it is to be noted that the statistical data gathered by James M. Carples, who has been abroad gathering data on the subject of rates of wages for us, exactly substantiate the above figures.

	France	Austria and Italy	Belgium	American
	Cts. per hr.	Cts. per hr.	Cts. per hr.	Cts. per hr.
Blacksmiths	11	8½	10	28
Machinists	9½	6½	10	25.8
Assemblers	11	9	..	24.6
Patternmakers	12	10	..	31.9
Apprentices	*	2	..	†
Electrical	12	7	..	25
Carpenters	9	..	6	33.4

* 2½ to 3 years no pay.
† Half pay while learning.

Italy Submits Recommendation

The Italian chamber of commerce in New York has submitted to the ways and means committee the following recom-

COMPARISON OF PRICES OF FOREIGN AND AMERICAN CARS

Henry B. Joy, representing the American motor car manufacturers, submitted the following comparison to the ways and means committee at Washington, which is considering the tariff on motor cars:

BERLIET, 40 HORSEPOWER		PACKARD, 30 HORSEPOWER	
Chassis, without tires	$3,200	Chassis, wholesale	$3,040
Less 30 per cent	960	Less tires	180
	$2,240	Net price	$2,860
Add 45 per cent duty. 5 per cent freight, etc.			
50 per cent	1,120		
	$3,360	We now undersell by $500.	
If we reduce again to chassis without tires	$2,800		
Less 35 per cent	980		
	$1,820		
Add 45 per cent duty. 5 per cent freight, etc.			
50 per cent	910		
	$2,750	They will undersell by $130.	
Not then down to fiat basis.			
FIAT, 40 HORSEPOWER		PACKARD	
Chassis, with tires	$1,800	Chassis, 30 horsepower, with tires	$3,040
Add 45 per cent duty. 5 per cent freight, etc.			
50 per cent of $2,200	$1,100		
	$2,900	They now undersell by $140.	
When they can prove as market value.	$1,800		
Add 45 per cent duty. 5 per cent freight, etc.			
50 per cent	900		
	$2,700	They will undersell by $340.	

To protect against this 65 1-10 per cent duty necessary.

mendation and arguments for a decrease of the duty on motor cars:

The present rate of 45 per cent ad valorem on motor cars was established when this latest of modern means of conveyance was yet a novelty, and its use, on account of much higher cost, exclusively confined, we may say, to the classes of most affluent means, and when the importation and the domestic manufacture of this commodity was far from the important position it has attained today. This rate will be recognized as decidedly too high under the present conditions, when the use of the motor car is becoming daily more extensive and finds its patronage not only among the wealthy and sportive classes, but also among people of more moderate circumstances.

The almost astonishing development in the manufacture of these machines during the last few years, due to a demand which overtaxes in many cases the productive capacity of the manufacturing plants, and the remarkable increase in the importation of motor cars for home consumption, which reached, in fiscal year ending June, 1907, the number of 1,100, valued at $3,923,634, with a unit value of $3,566, against an exportation of 2,862 machines, valued at $4,890,886, with a unit value of $1,709, shows that the motor car is growing daily into more popular use, and from the domain of luxury, to which it was confined in its earlier days, has now entered that of usefulness and of more general utilization. That it is ultimately destined to supplant the ordinary means of conveyance by animal traction may be taken as a foregone conclusion, the time when this desirable consummation shall have taken place being within commensurable distance, and its earlier or later realization depending upon the ability of manufacturers to place on the market machines at such moderate cost as to render this desirable substitution economically possible. An argument this, which seems by itself sufficient to substantiate a plea for a lower duty, in order to maintain as wide a field of supply as possible.

Americans Clever Financiers

From the unit cost above stated of American machines exported it is apparent that Americans can manufacture motor cars, pay good wages and still make a reasonable profit at a much lesser figure than foreign manufacturers, and that they are thus able to undersell the latter not only in the United States, but in foreign markets as well.

In no other country is the material entering the manufacture of motor cars—viz., steel, iron, brass, wood, leather, rubber, glass, etc.—cheaper or as cheap as in the United States, and this economic advantage, securing already to domestic manufacturers a natural protection, is more than sufficient to counterbalance any difference in the cost of labor, especially considering that in this line of manufacture, requiring specially skilled labor, the difference between wages paid abroad and in this country is by no means notable, if at all existant.

Foreign manufacturers are, in fact, at a much greater disadvantage in comparison with their American competitors, not only on account of the higher cost of material entering into the manufacture of their machines, which has to be imported from this and other countries, but also on account of the duties that have to be paid in the foreign manufacturers' home country on such material, and of the freights and contingent expenses both on the necessary material imported from abroad and on the machines exported to this market. These factors mean a further protection to domestic machines.

Foreign motor cars are bought in this country by reason of the special reputation with which certain particular makes have become identified through their efficiency. Each make represents, so to speak, an individuality of its own, embodying certain specific merits, which are the essential factor of their sale. Thus it cannot be said that they compete with any domestic machine, because their demand is conditional upon a certain specified make, which has deserved the confidence of the buyer, and also because their original cost is higher than that of the American machine. To handicap the importation of foreign machines with the present exorbitant duty is therefore to tax heavily instead of promoting endeavor to that greater efficiency which is, in the very interest of American industry, necessary to stimulate a wider use of this line of manufactures; is to put an unnecessary high premium or undue limitation on healthful sport; is to court possible combination of domestic interests to the detriment of those who use motor cars, and to deprive the revenue of the greater income obtainable from increased importation consequent upon a lower and moderate rate of duty.

Couzens Protests Against Increase

The tariff hearings before the ways and means committee were enlivened this week by the introduction of a letter from the Ford Motor Co., by J. C. Couzens, its secretary and treasurer, protesting against an increase of duty on motor cars. The letter, which was in the form of a brief, was, in part, as follows:

Within the past few days it has come to our attention that a large number of manufacturers of motor cars in this country, being, no doubt, a majority of the members of what is known as the American Motor Car Manufacturers' Association and the Association of Licensed Automobile Manufacturers, have appointed committees to attend a hearing granted by your committee on the subject of the tariff on motor cars. The time was so short that we did not have an opportunity of bringing the matter before the associations above mentioned, but we have written to all of the members of this committee vigorously opposing the petition which it proposes to present to your committee urging for an advance of the 45 per cent ad valorem tax now imposed on motor cars to 60 per cent ad valorem.

We believe that this petition does not represent the position and attitude of all the members of the associations referred to. We are unalterably opposed to any increase in this tariff. We believe that this so-called infant industry is fully protected all it should be, and, in fact, we believe the present tax is a greater protection than this industry should have. The industry has progressed sufficiently far, we believe, to not be entitled to any greater protection than would be represented by the actual difference in the amount of labor paid to manufacture motor cars in this country and that which is paid to manufacture motor cars in Europe. This difference is very small, as the amount of labor on motor cars in proportion to the amount of material is almost insignificant. If the tariff must be revised, it should be reduced and under no circumstances raised.

The majority of material entering into a motor car should not cost any more in this country than in foreign countries, and, in fact, on account of our national resources, should cost less, and if the tariff is properly adjusted so that the materials entering into the production of a motor car are not unduly protected by tariff, then it should be no question of the so-called "infant industry" getting any protection, beyond the labor above mentioned. This is an old worn-out argument—this question of protecting American labor against the pauper labor of Europe.

DENATURED ALCOHOL STATISTICS

Washington, D. C., Dec. 5—One of the government bureaus has lately received some highly interesting facts and figures regarding denatured alcohol in France which, in view of the interest that is being taken in denatured alcohol in this country, particularly in the motor car world, may be of profit to the trade. The total production of alcohol in France during 1907 was 64,441,275 gallons. Besides the native supply, France imported in 1907, mainly from Great Britain and Germany, 4,062,497 gallons and exported 300,532 hectoliters, being an excess of exports over imports amounting to 3,877,557 gallons. Deducting this excess from the total of production and imports, there remained a supply of 62,563,722 gallons for the various purposes of consumption.

Alcohol for industrial purposes is denatured in France, in the presence of a government official, by mixing with each hectoliter—26.42 gallons—of spirit the following standard denaturing mixture: 5 liters wood alcohol; ½ liter of heavy benzine, 1 gram of malachite green. The cost of these ingredients in the above quantities is about $3.83, which adds that amount to the price of 115½ liters of denatured alcohol and imposes what many consumers consider a burdensome tax on ethylated spirits. Notwithstanding this the consumption of denatured alcohol in France is steadily increasing, having grown from 3,871,296 gallons in 1897 to 15,689,147 gallons in 1907.

The statistics do not show the extent to which denatured alcohol is used as a fuel for gas engines or motors of any kind. Whatever may have been used for that purpose is included in the quantity designated as consumed for heating and lighting. The use of alcohol as fuel for motors has not yet attained in France the importance that was anticipated when the internal revenue tax was reduced to a merely nominal rate of 5 cents per hectoliter in 1901. These reasons are concisely the high cost of denaturing materials, the tendency of alcohol vapor when burned to corrode the interior of cylinders, and the fact that alcohol, without a large admixture of benzol or gasoline, does not explode with sufficient rapidity to meet the requirements of motor car practice, and requires to be used in motors with valves and ignition apparatus specially adapted to that purpose.

At the competitive test of commercial and industrial motor vehicles which was held in France in May last, a contest in which economy and tractive energy, rather than speed, were the principal elements of competition, a formal and highly successful test was made by a group of nine motor cabs, built by several of the leading French motor car makers, and which used as fuel alcohol, carbureted with a 50 per cent admixture of benzol of the brand known in France as benzol Lepietre. This mixture cost in France at the time of the competition about 24.6 cents a gallon. The cabs ranged in weight from 3,510 to 3,796 pounds, and during the tour under strict official supervision a test run of 69.6 miles in 3 hours 44 minutes, with a total consumption ranging from 6 liters, costing 38.6 cents, to 16 liters, costing $1.06, for the entire distance. This has had the effect of again directing attention to the subject of alcohol as a motor fuel.

TALK BRIARCLIFF RULES

New York, Dec. 7—The Automobile Manufacturers' Association, which is promoting the Briarcliff cup race, met today at the Automobile Club of America to discuss plans for the second renewal of the contest. An adjournment was taken to Wednesday because the meeting could not agree on what constitutes a stock car. With stock models of all sizes in the market, the trouble appears to be that it will be difficult to fix on limitations that will allow all in without having the smaller cars outclassed in power and speed. The Briarcliff, however, being a stock-car race, should, in theory, be run under conditions admitting all cars of stock model. There is, it is said, a probability that the committee will decide on a bore limitation of 5 or 5½ inches. There is no certainty that the race will again be held over the Briarcliff course, although the name will be retained.

THREE MOTORING BODIES HOLD MEETINGS

NEW YORK, Dec. 5—Three important meetings were held in New York city this week. The American Automobile Association's board of directors convened in its sixth annual meeting last Monday, then adjourned to Wednesday, at which time it elected its new officers for the ensuing year. That same day the regular monthly meeting of the executive committee of the National Association of Automobile Manufacturers was held and on Thursday the A. L. A. M. board of managers met.

Not much business was transacted by the A. L. A. M. board outside of the election of E. P. Chalfant as general manager of the association, Mr. Chalfant having served for several months as assistant general manager. Present at the meeting was George J. Dunham, the new president of the reorganized Royal company, which hereafter will be known as the Royal Tourist Car Co., who was congratulated on the discontinuance of the conduct of his company's business under court jurisdiction.

The Waverley Co., of Indianapolis, was elected to membership in the N. A. A. M. by the executive committee, which also made C. G. Stoddard, of the Dayton Motor Car Co., a member of the board. At the request of the American Automobile Association a committee, composed of H. O. Smith, W. E. Metzger and S. A. Miles, was appointed to serve on the executive committee of that body. The same men were appointed a committee to confer with the contest board of the American Automobile Association relative to the tour in 1909.

Favors A. A. A. Race Control

The executive committee adopted a resolution to the effect that in its opinion control of racing events in this country should be retained by the American Automobile Association. This action, however, had no bearing on the resolution recently adopted by the American Automobile Association declining hereafter to recognize races on 1-mile circular tracks. The executive committee promised its financial support to certain projects outlined by President Hotchkiss, of the American Automobile Association, who addressed the meeting at considerable length.

The traffic department of the association has recently arranged important changes affecting the transportation of motor cars to the south and west. While in the west recently Mr. Marvin, manager of the department, held meetings with the traffic managers of the various factories in and near Indianapolis, Detroit, Chicago and Cleveland. In each place a permanent committee was formed, which committee will hold meetings at regular intervals to discuss traffic details and take suitable action in relation thereto. It is expected that uniformity of opinion and closer coöperation between the factories and the traffic department will result and that a great deal of benefit will be derived therefrom. Further meetings of these committees were held last week. In due course the traffic managers of eastern factories will be similarly organized. The annual meeting of the association will take place Wednesday, January 20, probably at the Victoria hotel.

Reports of A. A. A. Officials

Among the actions taken by the American Automobile Association board was a decision to begin as soon as possible the publication of a monthly official journal similar to those issued by corresponding bodies in other nations, and the publication of such journal was placed in the hands of a temporary publication committee.

The report filed by Secretary Elliott brought out some interesting statistics, particularly with regard to motor car contests and the spread of the national idea represented by the American Automobile Association. Thus: During the past year but twenty-four sanctions for track meets were granted by the racing board, as against fifty-two in 1907; while, on the other hand, twenty sanctions were granted for hill-climbs, as against five the year preceding.

In the matter of membership, the national body now has twenty-five state associations, as against sixteen a year ago, and 187 clubs, as against 132 then, while the official membership of its present clubs was then about 17,000, and is now upwards of 20,000. Practically all of the northern states, with the exception of Maine, New Hampshire and Iowa, are federated into state associations; similar associations exist in California, Colorado and Oklahoma, while hopeful movements looking to state bodies are already under way in Iowa, Arkansas, Montana, North and South Dakota, Washington, Oregon, Louisiana and several of the other states. A notable fact is the growth of some of the more important clubs, that of Buffalo having increased from 1,150 to 1,501 members, the New Jersey Automobile and Motor Club of Newark from 640 to 1,450; the Philadelphia Automobile Club from 400 to 800; the Automobile Club of Kansas City from 320 to 520; the Automobile Club of Southern California from 330 to over 500; the Automobile Club of Minneapolis from 400 to 500, and the Springfield Automobile Club of Springfield, Mass., from 150 to 300.

MOTOR FUNERAL IN SAVANNAH

Savannah, Ga., Dec. 2—In like manner to that in which Norwegian warriors of old were buried, with their ships, so has the modern motor car been used as the funeral carriage of those who have lost their lives in the service of the Goddess of Speed. With the S. P. O. chassis from which he was catapulted for his hearse, the body of Marius de Rosa, of Marseilles, France, who was killed in the collision during the practice of the S. P. O. with a tree, before the recent Savannah light car race, was carried to its grave in the Savannah cemetery on Thursday morning last. De Rosa was mechanician of the car, Jean Juhasz being the driver. Members of the Savannah Automobile Club formed a procession of their cars behind the body. This unique cortege passed through the principal streets of Savannah, and along part of the road race course on which De Rosa was killed. Photographs of the procession will be sent to De Rosa's mother in France, who did not know that her son was in Savannah until a cablegram announced his death.

BREAKING NEWS TO KING

New York, Dec. 4—The Chevalier Cesare Conti, an American banker, who is prominent in the importation of Italian cars brought into the United States, is in receipt of a telegram which emanates from King Victor Emmanuel of Italy congratulating the winners of recent motor car races and of the Marathon race of last week. Mr. Conti cabled the king of Italy the day after Thanksgiving calling his attention to the fact that the Lancia car had won the light car race at Savannah; that Dorando, the Italian runner, had defeated Hayes, the American victor in the English Olympic games, in a contest at Madison Square garden on the same day, and that an Italian car, the Fiat, also had been a victor in the grand prize race at Savannah. The chevalier in due time received a cable from Tonzia Zaglia, one of the Italian ministers, the translation of which is as follows: "His royal highness much pleased at patriotic homage, referring to the sporting contest. He cordially thanks you and compliments the victories of the Italian entrants."

MICHELIN FIGHTS PRICE CUTTING

Paris, Nov. 28—Michelin is at war again with the Association Generale Automobile. This off-shoot of the Automobile Club of France sells tires, sundries, etc., to its members at the price they are usually delivered to dealers. Michelin objects to this, declaring that the association is robbing legitimate traders of business by giving to rich car owners a commission that rightly belongs to the dealer. Further, the association pays no trading tax, and is therefore robbing the state as well as the supply man. The case is now before the Tribunal de Commerce at Paris, Michelin claiming an injunction stopping the trading of the association, an indemnity of $40,000, and insertions in the newpapers. The defense of the associa-

tion is that the tribunal is not competent to judge the case, for it has been recognized by the revenue authorities, after a thorough examination of the association's books, that it is not a trading body. It declares that it does not sell direct to its members, but transmits all orders received by it to an agent who, for special reasons, is able to give a discount of 5 per cent on the Michelin product. There is no doubt that a certain amount of harm is done to agents by the system of giving discounts to members as practiced by the Association Generale and other bodies. The point is whether such discounts are legal, and herein lies the importance of the case. Judgment has not yet been pronounced.

ALLIANCE WITH ENGLAND

Philadelphia, Pa., Dec. 7—Philadelphia's women's motor organization—La Movigante Klaubo—has formed an alliance, offensive and defensive, with the Royal Automobile Club of England. So says its president, Miss Margaret L. Corlies, who also says that the union will be finally consummated and O. K.'d when the Movigante Klaubos hold their annual meeting this week. This unique organization, which is made up of twenty-five active women owners and seventy-five subscribing members, has a house of its own in Fairmount park—an old colonial mansion—upon which $4,000 was expended in repairs after the Fairmount park commission had granted the club the use of it gratis. The alliance will give those of the M. K.'s who tour abroad numerous benefits, especially in London and Paris, not to mention other advantages and privileges in the way of accommodations and rates in most of the larger European cities. The reciprocal advantages the M. K.'s can offer Royal clubbers who may happen to strike Philadelphia are in everyway equal to those gained by the fair Quakeresses, and this latest example of "hands across the sea" seems destined to redound to the benefit of all concerned in the transaction.

RUSHING NEW CADILLACS

Detroit, Mich., Dec. 7—The Cadillac Motor Car Co. is throwing in the high speed in its deliveries of its new model 30 and last week shipped a total of thirty-one cars, most of them intended for demonstrating purposes at the company's largest branches. The rate of production will be greatly increased within the month and the company expects to be getting out thirty a day by January 1. This gait will be maintained until the orders now on the books are satisfied. The company is at present away behind its orders. Not only in home but in export trade has the new model made a great hit. The company has received a peremptory demand for 100 for its London distributor, while no fewer than 300 orders have been received from South America and Australasia.

PRAISE FOR QUAKERS

Philadelphia City Officials Attend Motor Club Banquet and Compliment Hustlers

Philadelphia, Pa., Dec. 6—The Quaker City Motor Club made its initial plunge into society last Wednesday night when upwards of a hundred members and guests gathered at the Hotel Walton, the occasion being the first annual banquet of the club. All the prominent local and state political lights were present, the only absentee of importance being Governor Stuart, who was called suddenly out of the city in the afternoon on official business. President P. D. Folwell occupied the chair, and G. Douglass Bartlett, the club's counsel and chairman of its enterprising legal committee, introduced the speakers in short speeches fairly bristling with wit.

Mayor Reyburn, after being liberally plastered with compliments by the toastmaster, reciprocated in kind, and handed the club a bouquet or two, especially complimenting it upon the management of the 200-mile road race in Fairmount park, which wound up the founders' week festivities last October. The mayor also expressed his appreciation of the work of the club in assisting the authorities in suppressing reckless driving on the city streets and in the suburbs, and promised that as long as he remained at the head of the city administration he would aid in furthering every undertaking of the club. The mayor is a most enthusiastic motorist, and the possibility of inducing the authorities to allow the club to run the Fairmount park stock car race as an annual fixture was discussed informally during the evening.

Director Henry Clay, of the Department of Public Safety, responded appreciatingly when his work in guarding the Fairmount park course was lavishly praised by the toastmaster. The excellent work of the 1,400 blue coats on that occasion, asserted the latter, had set a mark which the promoters of other similar events have vainly endeavored to reach. The director lauded the motor car as an adjunct in municipal work and said the city is now negotiating with several manufacturers with a view of installing motor patrol wagons and ambulances, and doing away entirely with the horse-drawn vehicles now used in those services.

The Philadelphia-to-Pittsburg highway was boosted in a neat speech by W. Hicks, of Tyrone, Pa., who put in a plea for the adoption of the Juniata valley route when the route is finally decided upon. Edward Murphy, George Graham and A. Raymond Raff lent additional hilarity to the proceedings with witty speeches in which the club was praised and the city officials present shown how very necessary it is that an annual road race should be run here in order to boost the city of Philadelphia. Jack Hiscock, a local newspaper man, struck a popular chord when he advocated legislation which would do away with the double license fees collected from Philadelphia motorists by the city and the state. His remarks, indeed, were so much to the point that a motion was carried instructing President Folwell to name a committee of the club to go to Harrisburg next January to urge the passage of legislation which shall do away with the necessity of local motorists "coming up double."

QUAKER TRADESMEN MEET

Philadelphia, Pa., Dec. 7—The annual meeting and election of the Philadelphia Automobile Trade Association was held last week at its offices in the Odd Fellows' Temple, a surprisingly large proportion of the membership being present. The report of Secretary J. Henry Beck showed thirty-one active and fourteen associate members now on the roll, the former being motor car branch house managers and agents, the latter, tire and accessories dealers. A loss of five members during the year was more than offset by the addition of twelve new members. The treasury was shown to be in a comfortable condition, a neat balance being reported. The prospects for the next show seemed to indicate that it would be the best in the history of the association. The election resulted in the choice of the following officers to serve during the ensuing year: J. A. Wister, of Gawthrop & Wister, president; E. C. Vanderhoof, of Bergdoll Motor Car Co., vice-president; W. J. Foss, of the Foss-Hughes Co., secretary-treasurer; the foregoing, with A. E. Maltby, of Winton Motor Carriage Co., and Louis Block, of Ford Motor Co., to constitutes the board of directors. A luncheon was served after the meeting.

FARMERS HOLD WARM SESSION

Philadelphia, Pa., Dec. 7—The New Jersey Grangers, at their convention at Atlantic City last Thursday, spent a considerable portion of their time on the motorists. It was the consensus of opinion that the punishment for scorching was not sufficiently severe to fit the crime, and charges were made that the cost of state road construction had been increased by the use of flat-top specifications, whereas crowned roads would not only cost less to maintain but would give better service. It was broadly intimated that the former specifications had been adopted in several instances through the influence exerted by prominent motorists and incidentally several of the Grange leaders were lectured for participating in the recent love feast engineered by the New Jersey clubs, motor transportation to and from the said symposium having been provided by the latter to many of the "big smoke" agriculturists, who were given the time of their lives.

The Readers' Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems and invites a discussion of pertinent subjects. Correspondence is solicited from subscribers and others.

WANTS CARS THAT RUN WELL

CHASE, KAN.—Editor Motor Age—I have been an interested reader of Motor Age for some time, and in following the various contests in the way of hill-climbs, road races, etc., I cannot help but wonder what benefit they are to an every-day user of a motor car. Presuming I am a prospective buyer: I would not for a moment think of purchasing a car with a 60 to 120-horsepower capacity in which to take my family for an outing or even on a tour of considerable proportion. I do not care how fast my car climbs the hills so long as it gets to the top and that it can be counted on today and succeeding days. As a prospective buyer I would not care a picayune whether a car held a cup for running over a specially-prepared road at a rate of 70 miles an hour, but I would be vitally interested to know that a car, like the one I was purchasing, had traveled day in and day out over any and all kinds of roads and had "made good." I would, as a prospective owner, view with delight a contest in which reliability, dependence, performance, economy and general everyday worth would be the aim, instead of a cup for causing serious mishaps, to say the least. As a prospective buyer I would be pleased to see more Glidden tours, in which the rules compel the contestants to use stock cars, such as they would sell to me, I was particularly interested in some of the summer issues of Motor Age in which cylinder displacement and weight of the car were taken into consideration, and, if my memory serves me correctly, there were some surprises in the score at the close of the contest. As a prospective buyer, such contests would interest me. It is a car to use that people generally want and a contest that shows the merits of different cars for every-day use, rain or shine, up hill or down, good roads or bad, a long or a short run, will be the contest of real benefit to prospective purchasers.—Fred L. Willard.

STEERING KNUCKLE POSITION

Cripple Creek, Col.—Editor Motor Age—Will Motor Age inform me what the angle of the cranks or fingers on the steering knuckles of a motor should be with relation to the wheel base? Mine are not right, as is shown by the wear on the tires, and I desire to change them.—Fred McCloskey.

In steering gears the generally accepted principle is that known as the Ackermann-Jeantaud, which was invented in 1878 and is a modification of the original Ackermann principle. In the Ackermann-Jeantaud system the steering knuckles arms OL and 01 L1, when produced, meet in the plane of the rear axle or in this plane produced as shown by illustration, Fig. 1. The reader will appreciate that when the tie-rod L L is in rear of the front axle, the steering knuckle arms OL and OIL converge, as illustrated, but should the tie-rod be in front of the axle, these arms divert. Strictly speaking, the points A and AI, which are supposed to be in the axle plane, are not so, and the axle line A, AI, is a tangent to the curve in which the points of convergence will fall in a complete sweep of the steering wheels from axle to axle.

Several makers have, however, discontinued the design of steering knuckles on this principle, preferring to design them as illustrated in Fig. 2, in which the produced axis of the front wheels, A and B, intersect the axis of the rear wheel at a given point O. With this condition fulfilled, the vehicle will travel around O as an imaginary center. Enthusiasts of this method of construction agree that the Ackermann-Jeataud principle is sufficiently accurate for angles of not more than 30 degrees, but for angles varying from 30 to 45 they claim less wear on their tires by the latter construction. The exact arm for the angles in a steering gear of this nature will depend largely on the wheelbase of the car as well as the difference between the steering pivots A and B. In determining the correct angle of the arm, the first step is to ascertain the correct deflection of the outer front wheel for a given deflection of the inner wheel, it being apparent that the deflections will vary because the inner wheel is describing a circle with the radius AO, and the outer wheel a circle with the radius BO. If M is the deflection in degrees of the inner wheel pivoted at A and N the correct deflection for the other wheel, pivoted at B, then let a be the distance between the pivots and b the wheelbase of the car. Then

$$\frac{A\ C}{C\ O} = \cot\ m$$

$$\frac{B\ C}{C\ O} = \cot\ n$$

$$\text{Then } \frac{B\ C - A\ C}{C\ O} = \cot\ n - \cot\ m\ \frac{a}{b}$$

$$\text{Cot } n = \text{con } m + \frac{a}{b}$$

By assigning values to a and b in feet and inches, the correct deflection of the other wheel for the deflection of the inner wheel can be readily calculated by employing this trigonometrical table.

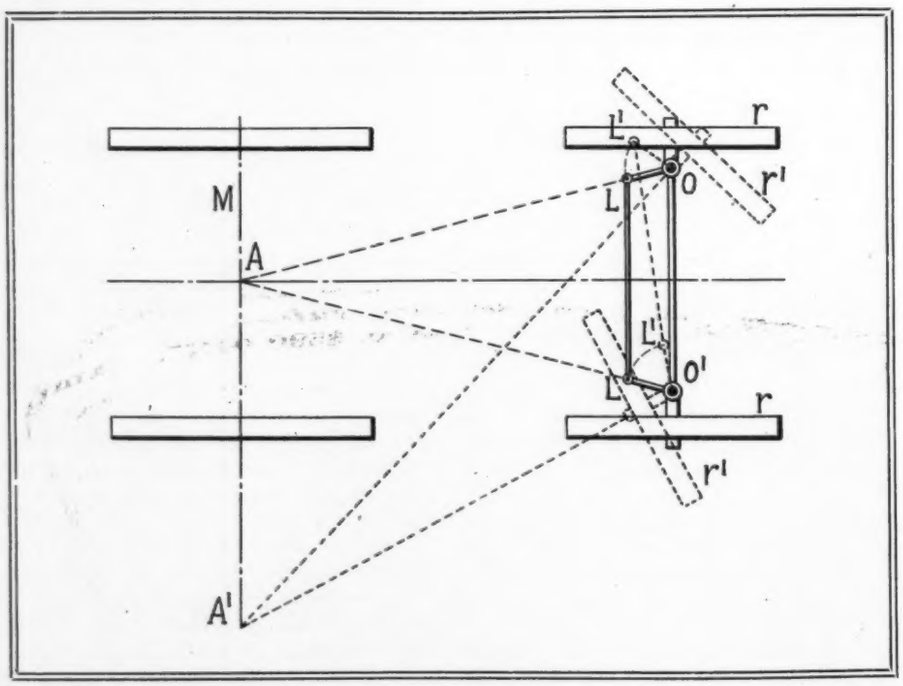


FIG. 1—THE ACKERMANN-JEANTAUD STEERING PRINCIPLE

FACTORY MAN AS CHAUFFEUR

Philadelphia, Pa.—Editor Motor Age—I purchased a car from a well-known eastern concern and wanted a man from the factory. In this particular shop they pay their men from 25 cents to 30 cents per hour, or about $16 a week. Very few owners of high-priced cars pay their chauffeurs less than $20 a week and often as high as $30. A man who has had out-

side experience on cars or done general repairing in the shop under guarantee is the proper party for a chauffeur. Such men are watching their chances, but the firm will not let them go, the foreman having strict orders not to recommend them. I know of one particular case where a man asked his foreman three times to recommend him to as many different purchasers of a certain make of car, but the recommendation was not given and no excuse for not doing so offered. I have in my employ a man direct from the factory and as a result I do not have to worry about my car; everything is in the same condition as when the car left the shop, and I know where to look for everything in the proper way. A word to buyers of 1909 cars: Go to the factory and look around, select your man, drop him a card on the sly or put an ad in one or two good motor publications under an assumed name stating you desire a man from the factory of your car. Should the party you have in mind answer the ad, then go to the factory and inquire in regard to him among his fellow workmen.—Six-Cylinder.

ON THE USE OF SOAP

Camden, N. J.—Editor Motor Age—I have noticed in recent issues of Motor Age several communications on the use of soaps for cleaning motor cars, and for the benefit of its many readers, the following information may be of value: In using certain soap dissolve 1½ ounce to a gallon of water. If cold water is used from 6 to 7 minutes is required to thoroughly dissolve the soap, the time required depending entirely upon the temperature of the water. A temperature of from 100 to 110 degrees will dissolve the soap much more readily, and have found 110 degrees to be the most satisfactory, dissolving the soap in 2 minutes, thus giving maximum results with minimum labor. Water of a higher temperature would be liable to injure the finish of the car.—R. M. Hollingshead.

SEPARATE VALVE HEADS

Chicago—Editor Motor Age—I have a motor in which the valves are made of two parts, that is, high nickel steel mushroom A with inserted carbon steel stem B. Everything seems to be all right excepting that occasionally a stem drops out of the mushroom and the consequences are hardly necessary to describe. At all events, I am curious to know why the stems depart from the mushroom.—H. C.

In the majority of cases the troubles related are conspicuous by their absence. The process indicates a percentage of this sort of trouble, because the high temperature on the exhaust side at any rate, will introduce variable conditions of expansion, since the metal of the stem and of the head are not identical, and again, it is impossible for machinists to invariably attain the same degree of tightness of the fit. It is customary in this class of work to "rivet over" in the manner as shown

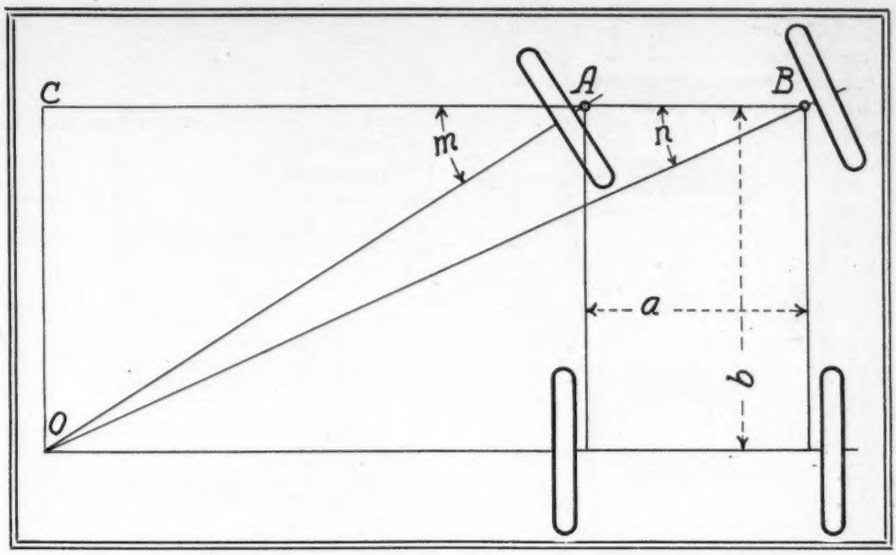
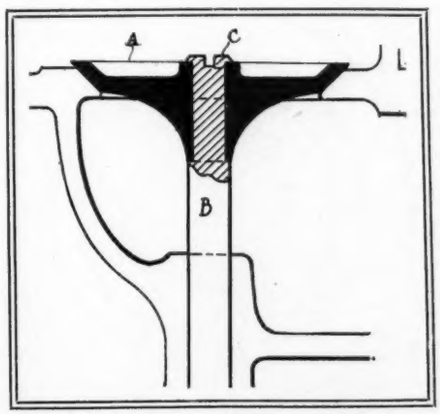


FIG. 2—DESIGNING STEERING KNUCKLE ARMS

in the illustration at C, the expectation from which may be briefly stated as follows: The static pull of the spring is 42 pounds, which spring is made 2 inches in diameter and five wraps of a $\frac{3}{16}$-inch diameter wire. If the shock imparted to the sheer section of the riveted over portion C is equal to the static pull then the sheering moment on the riveted over section will be 84 pounds. The riveted over section will stand 99 pounds in this particular case, if the work is as well done as the section drawing indicates, but the difference between 84 pounds initial sheering impetus and 99 pounds actual sheering ability is not sufficient to compensate for inequalities in degrees of perfection of the workmanship in practice.

METRIC SPARK PLUG THREAD

Schenectady, N. Y.—Editor Motor Age—In the course of work which I am doing I found it necessary to tap a cast iron bushing with a thread in order to fit a metric spark plug. I started to do this work on a lathe, but found it was a peculiarly odd number of threads, and I could not definitely decide how many threads there were to the inch. If you can, without inconvenience, give me this information; or, better yet, inform me where I can secure a tap for a day or so; I will be very much indebted to you.—F. C. Barton.



SEPARATE VALVE STEM AND HEAD

A millimeter thread gauge will enable you to ascertain the metric pitch of the threads in question. The metric pitch of threads is not one to be handled in English equivalents. If you consider that in the metric system you have a certain number of threads per centimeter, in your case, you can then proceed as follows: As, 1 inch : 1 centimenter : : 1 : 0.393704. With this information at hand, if you have a lathe such as will enable you to make the changes, reduce the motion of the screw to conform to the above proportion. If you can introduce into the screw-cutting train two gears, one of fifty teeth and the other of 127, it will be possible to do the work, for the reason that as, .3937 : 1 : : 50 : 127. There will be a slight error in the proportions as given, but it will cause no trouble at all. What you probably want is an 18-millimeter French tap for the work you have to do. If you cannot get one from your supply man, the next best thing will be to proceed as above.

USING CASTOR OIL

Charlotte, N. C.—Motor Age—In a recent article by Rene M. Petard mention was made of the possible use of castor oil in motors of high piston speed. I would appreciate knowing if this oil is superior to mineral oils.—O. H. Barringer.

The advantages of castor oil over mineral oils for high-speed piston travel in gasoline engines is a very vague quantity in America, because of the fact there is not a single known case of where it has been used this side of the Atlantic. It is true that castor oil could only be used in exceedingly warm weather because its nature is such that on cold days it would completely congeal into a semi-solid, rendering its use impossible. It has a flash test lower than that of many of the mineral oils used for cylinder work. The important thing in an oil for piston speed above 2,000 feet per minute is vicosity,

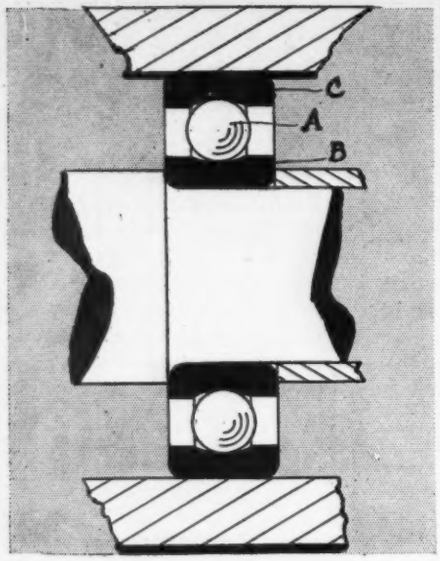


FIG. 1

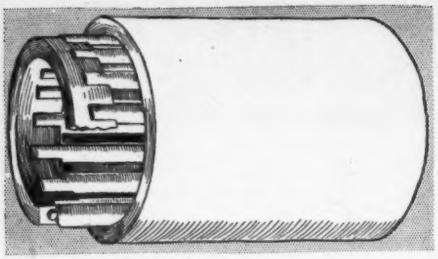


FIG. 9

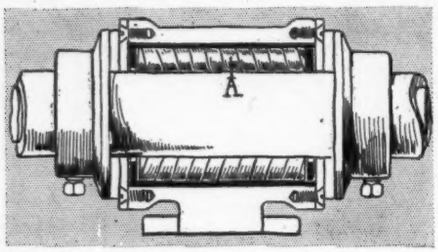


FIG. 11

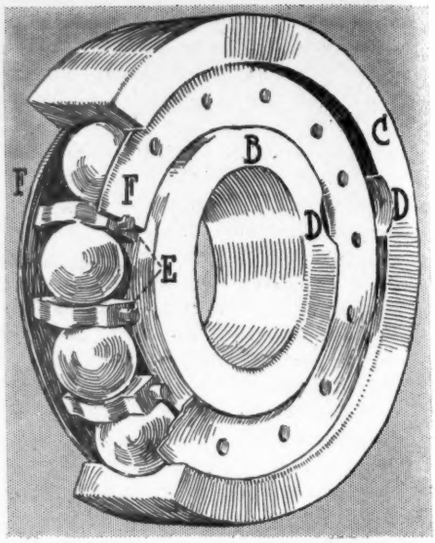


FIG. 3

and on which subject Motor Age is without definite information. As stated in Rene Petard's article on the possible use of castor oil, it is expected that it would only be used on the day of a race and 1 or 2 practice days, this being imperative because of the cost. It is not expected that many of the big four-cylinder cars will use it unless they make use of 10-inch strokes, which is hardly looked for in view of the fact that the cylinder bore will be limited to 5.1 inches. It will be used, however, in the single-cylinder cars such as participated in the grand prix voiturette race in France this year.

VARIOUS BEARING TYPES

Chicago, Ill.—Editor Motor Age—Will Motor Age inform me where I can purchase a book descriptive of the different bearings, such as roller and annular, which are used in a motor car?—Reader.

Motor Age is not aware of any book treating specially on the different types of ball and roller bearings as desired by you. Some general information on bearings may assist you. Ball bearings divide themselves into three great classes—the annular ball type, the cup-and-cone type, and the thrust bearing of whatever type it is. In the annular ball bearing, Fig. 1, a race of balls A is contained between an inner retainer B and an outer race C, there being grooves in the opposing sur-

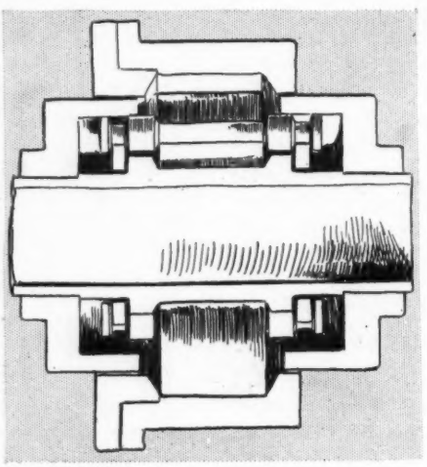


FIG. 12

faces of these to receive the balls. In a Hess-Bright bearing of this type, as illustrated in Fig. 2, the entire space between the races C and B is not occupied by balls, but is utilized in different ways. For example: In the original Hess-Bright bearings, a spring S with steel washer and felting was interposed between each pair of balls, thereby maintaining them at a fixed distance apart. In assembling this bearing the race B is placed eccentric to the race C and the requisite number of balls slipped into position, after which the race B is made concentric with the race C and the balls regularly distributed. This done, the separating springs S, with lubricating means, are installed. Once the springs are in, the tension of them is such as to make the bearing self-contained.

In different types of annular ball bearings different methods of separation are used. In the Schafer bearing, Fig. 3, 92 percent of the annular space between the races B and C is occupied by the balls, a particularly valuable feature of the bearing. It is possible to get this number of balls between the races B and C by means of entering spaces D, in one side of the races, the balls are separated by spacers E, which anchor to rings F. Each spacer E has its sides grooved to accommodate the balls. In the F & S annular

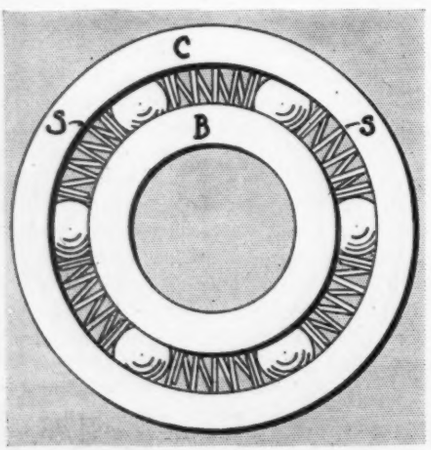


FIG. 2

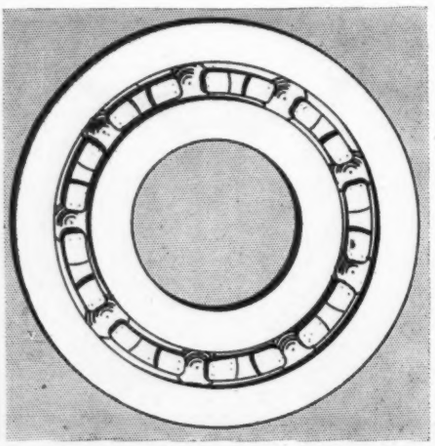


FIG. 4

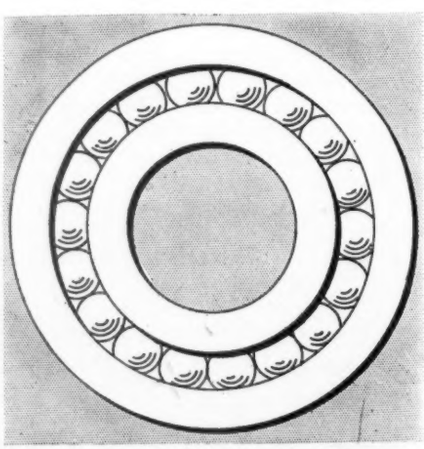


FIG. 13

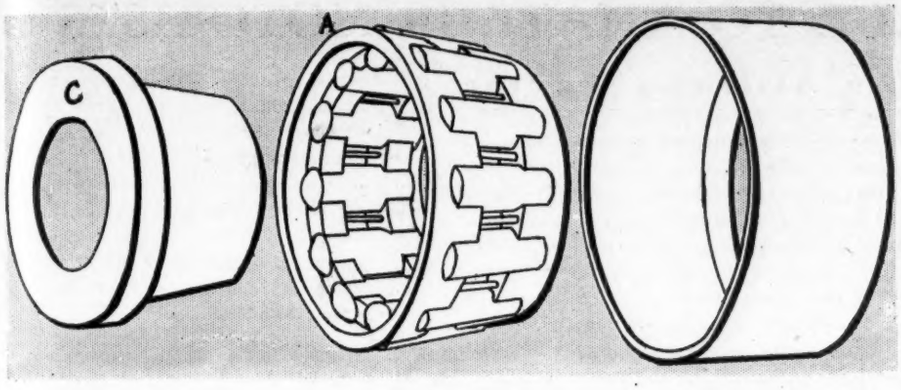


FIG. 10

ball bearings the balls are carried between concentric races and are located directly in a special carrier made in halves which halves are anchored together by brass wires of dove-tail section which are inserted in dove-tail grooves and have their ends clinched over into notches in the sides of the separators.

The latest type of Hess-Bright bearing is made without the spring, referred to in Fig. 4, and has the balls retained by separators Fig. 4. These separators are positioned after the balls are fitted and permit of carrying a greater number of balls than where the spring separator is used. The Standard Roller Bearing Co. manufactures a type of annular ball bearings, in which the entire space between the internal and external races is filled with balls, Fig. 13. In the ordinary type of cup and cone ball bearing, the construction is confined to a cup portion A, Fig. 6, and the cone portion B, between which are the balls C. These bearings are adjustable in that the cone B can be brought closer to, or removed from the cup A, giving the desired relationship between the balls.

Among the different types of roller bearings is the Timken product, Fig. 7, in which the central portion A shows the cone with a series of rollers, the right portion, the cup B, which fits over the rollers, and the left portion, the cone C, designed to fit within the bearings A. Bearings of this nature are well adapted for end thrust purposes. Fig. 8 shows another view of the cup B, the cone C, and the rollers A, and in another portion of this illustration appears an illustration B showing a complete view of one of the rollers. The Standard Roller Bearing Co. manufactures a type of roller bearings, illustrated in Fig. 9, in which the casing and rollers are shown, the rollers withdrawn slightly at the right end. It will be noticed that these rollers are held in ring cages at the end, in which they have a bearing, and which cage serves to maintain the relative position of the rollers to one another. This company in its new type of Grant roller bearings, Fig. 10, uses the conical or tapered rollers. It employs solid rollers with races and cones made of special steel. The cage or retainer, shown in the center of the illustration, consists of individual

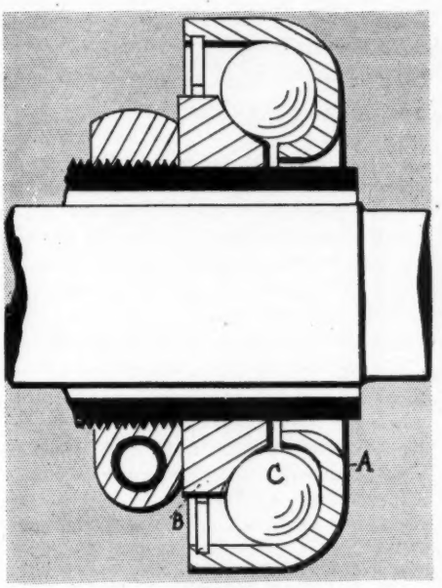


FIG. 6

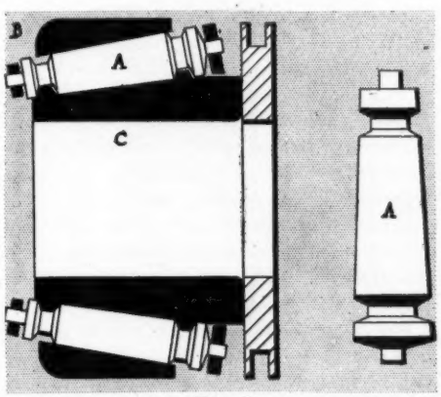


FIG. 8

sockets or races in which the ends of the rollers rest, and is made with the two ends securely riveted together. The cone is made with a very wide shoulder against which the end of the rollers have a bearing. In Fig. 11 appears a view of a distinctive type of roller bearing, the Hyatt, in which are used flexible rollers A, consisting of strips of steel rolled in the form of coil springs, forming a strong elastic support and capable of taking considerable end thrust. These bearings have had a very wide use in rear axle construction. The American roller bearing is of the horizontal roller type, Fig. 12, the roller having coned ends forming a bearing.

NINETY POUNDS TOO HIGH

Schenectady, N. Y.—Editor Motor Age—Referring to Mr. Maxim's article in regard to the proper pressure to carry in the tire, I do not doubt but what many of us do exactly what Mr. Maxim states and guess at the pressure. I would like to know what effect 90 pounds pressure will have on your tire should you start on a good hot day on a state road and hit it off around 40 or 50 miles an hour? It is all very well to say the tire companies request a pressure of 90 pounds. My experience has been that I have lost more inner tubes and shoes due to my tires being exceedingly hard and running them on a hot day at a high rate of speed. For the last 2 years I have been pumping up my tires and have been guided entirely by stepping on the hub and seeing if there was any give to the tire, and have had no explosion. If we did pump our tires up to 90 pounds, and the same exploded, do you suppose the tire companies would protect us for carrying the pressure they demand? Personally, I believe that the same old story of running over nails, hatchets, etc., was the cause of the damage, and not that the tire could possibly explode.—H. N.

WHY INNER WHEELS RISE

Denver, Colo.—Editor Motor Age—Will Motor Age explain why the inside wheels of a motor car leave the ground when turning?—A Subscriber.

This subject was fully discussed in the Readers' Clearing House, Motor Age, issue August 6, page 19.

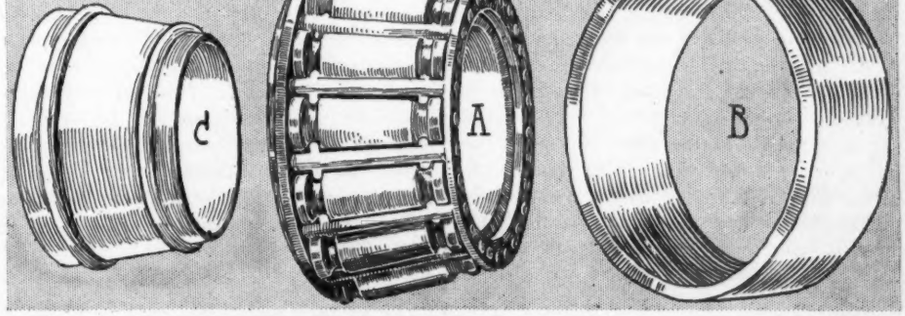


FIG. 7

HINTS OF VALUE TO AMATEUR MOTORISTS

By Stillman Taylor

THE art of driving a motor car is at once both easy and difficult, simple or complex, depending altogether from what standpoint the subject is looked upon. If driving means nothing more than steering and controlling the car on a smooth roadbed the subject is certainly an easy one, quickly mastered.

But if the art of driving is taken in the full, clear sense of the word, there is much to learn, because in this latter definition is not only meant the actual guiding and control of the car, but the entire future up-keep or maintenance of the machine.

The motor car, with its delicate, sensitive, and finely adjusted mechanism, demands good care and constant attention to keep it in prime working condition, and, if neglected, we may be certain that trouble and annoyance will follow. Little things are often of greater importance than those of larger size, and as the motor car is a creature of many parts, it is attention given to the "details" that spells success in motor handling.

It is not the writer's intention, however, to give in this article "a compendium of motor lore," but rather to mention some of the important points which ought to be considered by all motorists. Although these hints are written with the idea of helping the owner of a first car, it is possible that the more experienced "mile eater" may find at least something worth the reading.

It has long been a mystery to the writer why motorists almost universally use the right hand for cranking the motor. As gasoline motors revolve like the hands of a watch—from right to life—there is always a possibility of injuring the hand or wrist should a back-fire occur when cranking with the right hand. And, again, the position which the body must assume when the right hand is used is awkward in the extreme and being twisted around that more force may be exerted, the balance of the body is not at all secure.

Avoiding Back Pressure Accidents

Back-pressure accidents may be averted by employing the left hand, and while makers of the Darracq and other cars have for several years advised the adoption of left-hand cranking, operators have always been slow to accept this good advice. The advantages of employing the left hand for starting purposes are many, and, once tried, will surely be adopted.

In left-hand cranking, the motorist stands squarely in front of his car, the right hand having a firm grip on the radiator or dumb iron. The handle is grasped firmly, but loosely, with the fingers of the left hand curved around the handle. As the feet are placed widely apart, a good balance of the body is assured, and, if a back-fire should occur, the elbow is not cramped, as is the case in the right-hand method, but the hand is thrown outward and upward, the loose grip permitting the fingers to fly open, and all risk of injury is done away with.

More force may also be given, as the right hand on the radiator materially assists the other member to turn the motor over quickly and without undue effort. Now that the low-tension system of ignition is becoming quite generally used, quick cranking is necessary for a start, and the use of the left hand will, after a single trial, convince any driver that it is the safest and easiest way to crank.

Carelessness of Some Drivers

It is astonishing how little care many operators give to the cluch-operating mechanism, which gear is, for obvious reasons, one of the most important parts of the whole car. That the several parts of the clutch at all times should be well lubricated is self-evident, as this mechanism is in almost constant use in throwing in and out the speed gears. In some makes of cars using clutches of the multiple-disk type, the mechanism is enclosed in oil-tight cases, in which case the lubrication of the clutch collars and connecting lever is automatically performed.

But in many cars using the cone clutch, and in every case where the clutch does not run in an oil bath, oiling must be done by hand. In this case, the joints of the clutch pedal, its bearings and pins, clutch rack and pinion, clutch collar—where same slides on its shaft—brass shoe of collar and thrust bearings should be kept clean and well supplied with oil.

The matter of proper grease lubrication is not always given the careful and systematic attention which the subject deserves. In fact, many drivers who give regular and painstaking attention to the engine, transmission and runing gear, all too often neglect to give the grease cups the same careful and thorough consideration.

Grease lubricators do not, of course, require as frequent attention as other oiling points, but they should always receive their share of attention in proportion to the work such parts are called upon to perform.

Do not be content with a superficial glance or take for granted that because you screw down the cap, the grease must necessarily feed to the bearings it is intended to lubricate. This applies especially to the lubricators on the steering pins, which should not only be kept well filled and given a daily turn or two, but the motorist should know that these vital parts are being well lubricated.

It is always a good plan to refill and screp down the cap until the lubricant is seen to ooze out of the steering socket. In this case the motorist is positive that the steering gear is well taken care of and that no trouble will be caused by insufficient lubrication of these parts.

On most cars grease cups are used to supply the lubricant—light grease—to the following parts: steering knuckles, steering cross tube, steering reach rod, shaft of water pump, commutator shaft, clutch shifting collar, journal of transmission sleeve, front and back hubs.

Adjusting the Spark Coil

To properly adjust the coil is not, as many suppose, a difficult matter, but, on the contrary, is a simple operation when once it is understood. In most coils only two adjustments are necessary, and anyone should be able to make them in a comparatively short time.

To adjust a coil, shut off the gasoline and turn the motor over by hand until the timer makes a contact with the coil needing adjusting; then turn on the switch. Next loosen the set nut until the adjusting thumb screw can be turned with the thumb and finger, and with a fine-cut file—a thin manicure file is just the thing—remove any deposit that has collected on the platinum contact points. This done, turn the screw to the right until the vibrator commences to buzz, then lock it by means of the lock or set nut.

In case the adjustment is still imperfect, the trouble will likely be found in the vibrator spring. This spring may be adjusted by first loosening the lock nut, as before described, and turn the adjusting screw to the right, or until there is a space which is approximately 1-32 inch between the platinum points, when the armature is pressed down and against the core. Lock in position by the set nut on adjusting screw. This lock nut has a right-hand thread. Now unloosen the set nut on the vibrator block and turn the adjusting screw—the upper screw in both instances—until a light contact is established between the points—then lock in position.

Light Tension Desirable

A light tension between the platinum points is desirable, as a stiff tension not only renders the coil less responsive, but will exhaust the batteries quicker and often causes the contact points to become pitted.

The only secret of keeping a coil in the best condition is to fool with it as little as possible and to keep the vibrator points clean and smooth, and to adjust these points neither too tight nor loose, but at a medium tension. The vibrator spring should be fairly flexible and buzz at a moderately high pitch.

Once properly adjusted, the coil should require very little attention. Once a week the vibrator and coil plates should be cleaned with a small camel's hair brush.

No matter what make of car you may have, it will be found necessary to grind

the inlet and exhaust valves occasionally, and just how often this should be done must largely depend upon the amount of running.

When the motor begins to lose power and falls off to a noticeable extent, it is a pretty good indication of three things: faulty carburetion, improper ignition or poor compression. The latter two causes are by far the most common, and if the electrical plant has been examined and found satisfactory, the trouble clearly points to bad compression.

In case the compression seems to decrease, it is probably due to the inlet or exhaust valves sticking or not properly seating themselves, hence the leakage. The cause is due to the lubricating oil carbonizing by the extreme heat generated within the cylinder, and the remedy is to remove this crust or sooty deposit.

To find out whether there is need of grinding, the valves should be lifted out, and if not bright—as they should be—but black, pitted, or streaked with soot, there is certainly a leakage of gas, and they must be ground.

That a thorough job may be done, it is best first to take off both inlet and exhaust pipes, which enables one to clean out the valve seats and openings, and also prevents the possibility of any particle of the grinding mixture from being sucked into the cylinder.

To prevent any of this from falling into the cylinder while grinding the valve, a small piece of waste it tied to a length of strong string and jammed into the cylinder. If any of the mixture should happen to fall off the valve, the waste catches it, and when the grinding is done may be drawn out with the waste by means of the string.

Emery Preferred for Grinding

For grinding purposes, carborundum, ground glass and emery are all quite commonly employed, my preference being for the last named. In any case, only a finely ground cutting medium should be used, as coarse emery will cut too deep and make the valve seats rough. Emery known as 120 is the most satisfactory for this purpose.

Don't make the mistake of using too much emery; only a very small quantity is required. A convenient way is to put a very small amount of emery in a small saucer and add a spoonful or two of kerosene—don't use gasoline—to make a thin, watery paste. A few drops of lubricating oil should then be added to give the mixture a little more body.

Remember that a few grains of emery and plenty of kerosene and cylinder oil will not only do a smoother job, but do it much quicker than a thick emery paste. When the waste is in place, put a small quantity of the grinding mixture on the bevel face of the valve and by means of a screw-driver, placed in the slot of the valve, carefully grind the valve by rotating it in its own seat in the cylinder.

Don't turn the valve in one direction only, but lift it out of its seat frequently, and turn it first one way, then another. The reason for lifting it clear of the seat is to prevent any foreign substance which may get into the emery from injuring and scoring the seat or valve. No greater force is necessary to rotate the valve in its seat need be used, and by frequently lifting the valve and reversing the grinding motion, the face and seat will be uniformly ground.

Care Needed in Grinding

Ten minutes' grinding should be sufficient to properly seat a valve which is in fair condition, but a badly pitted valve will need longer grinding to make it clean and bright. When completed the valve should be removed from the cylinder, thoroughly washed with kerosene, and the valve seat wiped out perfectly clean.

Exports and Imports

Washington, D. C., Dec. 5—The latest government returns issued this week show that during October, 1906, motor cars, valued at $165,837, were shipped to various foreign countries, as against 201 cars, valued at $276,198, exported during October a year ago. The value of the parts exported increased from $41,905 in October, 1907, to $47,938 in October last. During the first 10 months of this year 1,918 cars, valued at $3,971,406, and parts to the value of $525,097 were exported, as against 2,622 cars, valued at $4,718,676, and parts to the value of $563,312, exported during the corresponding period of last year. Cars and parts were shipped to the following countries during October last: United Kingdom, $63,595; France, $5,531; Germany, $5,735; Italy, $1,986; other European countries, $10,437; British North America, $49,142; Mexico, $30,366; West Indies and Bermuda, $15,644; South America, $3,519; British East Indies, $170; British Australasia, $15,785; other Asia and Oceania, $10,264; Africa, $1,310; other countries, $291. The dutiable imports of motor cars during October last numbered 179 machines, valued at $327,511, together with parts valued at $54,349, as against 132 cars, valued at $291,094, and parts to the value of $44,166, imported during the same month of last year. During the 10 months of this year the number of cars imported was 1,135, valued at $2,131,400, and parts valued at $505,818, as compared with 862 cars, valued at $2,602,016, and parts valued at $590,967, imported during the same period of last year. The month's shipments of cars were received from the following countries: United Kingdom, twelve, valued at $29,541; France, 111, valued at $191,951; Germany, six, valued at $9,502; Italy, forty-eight, valued at $89,437; other countries, two, valued at $7,080. The report is interesting.

Keeping Cylinders Clean

That your car may at all times run smoothly and powerfully, it is highly important to keep the inside of the cylinders clean. There is no excuse for letting this part of your motor become foul—it is rank negligence and nothing else—and if you allow the cylinder and piston-head to become encrusted with carbon, is it any wonder that your engine knocks and pounds and loses power?

The writer has overhauled many a car brought in because of lost power, repeated knocking, etc., and upon taking the engine down, the cylinders were invariably found to be in a foul condition. In some cases, the piston-heads were so choked with this deposit that it seemd incredible that any self-respecting motor would consent to run under such conditions.

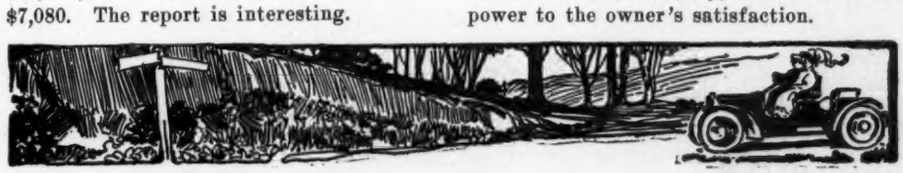
The cause of this sooty state is, of course, the oil used for lubricating the cylinders, and while all oils contain some carbon, those grades having a low fire test will obviously foul the cylinders much quicker. As the temperature within the cylinder is some 1,000 degrees Fahrenheit, it must be evident to all that a low-test oil will be entirely burned up and consumed before it can fulfill its mission of lubrication. It, therefore, stands to reason that only a high-grade gas-cylinder oil should be used in the cylinders, and such an oil will have a flash point of some 450 degrees Fahrenheit.

Beware of Carbon

The motorist should never allow the cylinders of his motor to become carbonized to any extent, but frequently flush them out. This may be easily done as follows:

Unscrew spark plugs, and place pistons at the outer end of the stroke, or at the outer dead center as per marks on your flywheel. Now fill the cylinders—through the spark plug holes—with kerosene and let it remain overnight. The next morning open the pet cocks in crankcase, or, better yet, unscrew them, and drain out the dirty kerosene. This done, replace pet cocks, start the motor, and open the pet cocks to blow out any deposit that may remain in the cylinders.

Cylinders should be cleaned in this manner at least twice a month—every week will be better—and if this is done often, no considerable deposit of carbonized oil will accumulate, and the car will always run at its best, smoothly, and at its rated power to the owner's satisfaction.



HEAT TREATMENT OF STEEL FOR MOTOR CARS

HARDENING through and surface hardening are quite different processes. For surface hardening the "cementing" process—sometimes called case-hardening—is called into play. In this process the primary consideration is that the steel shall be low in carbon. If the carbon is above 20 points, however, the results will not be satisfactory. The reason for this, as before stated, lies in the fact that the core, under the shell, will be hard and of a non-dynamic character.

Cementing can be done in the muffle furnace or in the metal salts bath; the results will be nearly the same in either case, because in the cementing work the parts to be treated are placed in hermetically sealed iron boxes, completely buried in hardening powder. The result is the parts are not exposed to the uneven heat of the products of combustion in the muffle furnace, or will sudden fluctuations of heat be imparted to the steel to be treated.

The softer the steel is, the lower the carbon, the better will be the core from the kinetic point of view. This will be especially true if the metalloids are low and the texture of the steel that is possible of attainment by the acid process. However soft the core may be, it will be toughened in the oil quenching and subsequent tempering process. The shell, originally, however soft the core, will take on the hardness due to cementing, and it is possible to impart to the surface of even dead soft iron, enough carbon to render the shell glass hard.

Approximate Cementing Temperature

The cementing temperature is about 900 degrees Centigrade, as a rule, but higher temperatures will result in an increased depth of carbonizing while the hardness due to quenching will be greater for a greater difference as between the quenching bath and the temperature of the steel as it contacts with the quenching bath. Carbonizing should not be done at temperatures higher than the occasion would require and 1,000 degrees Centigrade would seem to be the maximum.

The time required to carbonize will depend upon the composition of the steel and the temperature. Swedish iron, very low in carbon—5 points is a fair figure—will take the longest and the highest temperature. Chrome nickel steel, with carbon at about 20 points, would probably take the least time in the carbonizing. In this latter case, too, the temperature should not go above 900 degrees Centigrade.

The finest nickel steel products run about 10 points carbon for cementing work. With alloys the problem is one demanding more care, greater precision of temperature regulation, and finer steel. The hardening powder may be Krupp hardening powder, for the grades of steel such as the Krupp company usually furnish for motor car work or the great variety of products for

EDITOR'S NOTE—The following is article II on this subject by Thomas T. Fay, president of the Society of Automobile Engineers. Article I appeared in Motor Age December 3, pages 44, 45 and 46.

this purpose can be used with more or less success. One point is certain, however, the same materials should be used every time in any given shop because it is not possible to do uniform work and change the powder frequently. Of the various materials used for the purpose the following are a few:

Suitable Cementing Materials

If the electric furnace is available it will be a simple problem, since cyanide of potassium may be melted in the furnace and raised to the desired temperature. The pieces to be carbonized may be hung in the molten bath and left there for the requisite period of time, depending upon the composition of the steel. The formula of this compound is K Cy=KCNO. In this we have the carbon and nitrogen, the property of the latter being to increase the penetration of the carbon. It is for this reason the indiscriminate use of cyanide of potassium is not recommended by the author, in the manner as one can observe without traveling far. The steel must be low in carbon to warrant the use of this compound. Of cyanide of potassium the *Materia Medica* has to say as follows: "Characteristics.—White, opaque, deliquescent, crystalline mass, having the color of hydrocyanic acid, readily soluble in water, intensely poisonous. Semple.—It is a matter of the greatest importance to remember the poisonous nature of this compound." The temperature of the molten bath can be about the same as for cementing with any hardening powder, or slightly less, while the time to grow the requisite depth of carbon will be a little less. The method is rapid since there will be no need to pack the parts to be hardened.

Using Bone Products

If bone products are to be used in the carbonizing process, they will rank, as regards their ability, in proportion to their fineness. The smaller the mesh through which the bone will go the more effective it will be as regards time shortening in the process. The coarser the bone is, the more space must be allowed around the parts in the box, for the bone, the actual weight of bone will be less since the per cent of voids will be the greater for the coarse bone. For slower work, mixtures of bone and charcoal will serve the purpose while, to shorten the time, fine bone and charred leather will serve the purpose.

Cyanide of potassium and common salt, sodium chloride, may be added if it is desired to increase the penetration, and the proportions of the component compounds can be varied over broad ranges. There is no need to risk experiments in a matter of this sort since very satisfactory results can be realized through the use of bone under suitable conditions. At all events, if a muffle furnace is to be used it is essential to pack the parts to be hardened in a box, cast iron, provided with a cover, so arranged as to permit of "luting" the cover with fire clay, to thoroughly seal the box. The box must be so roomy as to enable the parts to contact with the box.

The parts must be put in the box and the bone must be tamped in and around the parts tightly. Surfaces not to be carbonized must be protected by fire clay to an adequate depth. Warping must be aborted by avoiding any way by which the parts to be hardened will receive an uneven pressure. When all is ready the box can then go into the muffle furnace, the furnace can be up to heat, and the time of carbonizing will then count from the time that the contents of the box reach the cementing temperature.

Warping When Quenching

In the quenching of carbonized parts warping is very prone to follow, this is especially true if the metal is of a fine grain, but it is almost impossible to avoid it if the metal has been bruised in a previous forging process, or if the steel has been properly forged but not annealed before going into the cementing process. A medium grain uniform texture, not forged, steel will behave very well.

Warping is also due to unsymmetrical shapes and to the manner in which the parts are allowed to make contact with the quenching bath. Warping is also much to be dreaded in cases of high quenching temperature, and if the quenching bath is both cold and of high specific heat, or if the property of disseminating heat is marked. Oil quenching from a low temperature then would be less likely to cause warping than water quenching from a high temperature. On the other hand, salt—sodium chloride—in the water would to a considerable extent abort the warping tendency.

Warping will generally follow if the parts to be hardened are not deftly lowered into the quenching bath, in a plane parallel to the greatest length. Tumbling the parts into the bath *en masse* is but to warp them. If the bath is of some media of a high boiling point at the atmospheric pressure the tendency to warping is somewhat less, since steam will not then insulate the hot surface unevenly.

Warping is due to the unequal distribution of the strains, and if the parts do not cool equally over all zones, strains will be set up in a manner unequal. Obviously, the thin portions will cool the first and

the masses of metal last; any means of equalizing these tendencies will have a lasting benefit. Camshafts, for illustration, are very prone to warp; they must go into the bath end on and quickly.

To Nest Gears and Parts

It is difficult to keep the bath from forming a layer of steam over the hot surfaces of the parts, and to avoid this the parts must be kept moving in the bath until the metal has cooled below the danger point. Gears, sprockets and other disk-like parts should be nested and clamped between soft iron plates in such a way as to perfectly expose the surfaces to be rendered hard, yet withal to prevent warping. Gears will curl if they are not thus nested, and in that the nesting is desirable in that the number of gears that can be handled in a given time will be more.

In tempering—drawing the temper—there are two objects, viz.: To render the steel dynamic, increase the kinetic ability, and to equalize the internal strains. Even if the internal strains are below the ultimate strength of the steel—below the warping point—they will abound to a greater or less extent, at any rate, to the detriment of the parts, since from the ultimate strength must be subtracted the internal strains. This is a matter not usually well understood, but it is plain enough if it is given but a moment's thought. If the ultimate strength of the steel is equal to a and the internal strain in a zone is equal to b, the remaining strength will be equal to a—b=c. Illuminating the internal strains will restore the original strength: b+c=a.

What Steels to Treat

There are still a large number of points in relation to heat treatment that could, with profit, be discussed. Take for illustration the question of composition; to heat some products would be to ruin them. On one occasion the author ordered some nickel steel to be as follows:

	Per cent		Per cent
Nickel	3.5	Phosphorus .	0.04
Carbon	0.25	Manganese ..	0.40
Silicon	0.20	or within 5 points be-	
Sulphur	0.04	low.	

The material came and was worked into the desired shape. The parts were then quenched from 900° C. and subsequently tempered at 250° C., with what result? It was a waste of time. It was not a waste of material, waste cannot be wasted, the parts were brittle as unannealed glass. Further investigation of the matter showed that the reliable vendors of the product, furnished a special heat of a product that was to be better than the steel usually to be had on the open market, which special heat—when chemically investigated—proved to be as follows:

	Per cent		Per cent
Nickel	3.05	Phosphorus ..	01.05
Carbon	0.42	Manganese ..	0.55
Silicon	0.28	far too high in nick-	
Sulphur	0.08	el; metalloids high.	

Why did we not subject the steel to an analysis before working it up? The requirement as the original specifications would indicate, was not the finest steel by any means; it was not supposed that any steel mill would fail to fill an order of steel of no more than moderate quality; at all events the steel would not stand for heat treatment, and that is the point.

The absence of carbon, excepting as a necessity in production—limited to a low point—would render the steel more nearly universal in its application than would be the case were the carbon present in any considerable amount. The steel could then be subjected to "heat treatment" to impart the several desired qualities, without danger of destroying the dynamic ability of the same.

In the absence of carbon it would be possible to consider alloying as a regular thing. This statement takes into account the fact that the carbon would have to be present in quantity sufficient to render the fabrication of the steel possible. The carbon could be limited to say, 0.10 per cent—maximum—under which conditions nickel would impart excellent qualities, and chromium would be of exceeding value. Even vanadium might be an ingredient in what could be called a universal product. It will be understood, however, it is not well to have more than two alloying elements in any product on the ground that uniformity cannot be assured when the alloying process is complex. Even one alloying element is better than two, if with one element the desired qualities can be imparted to the steel.

In the long run it is the ultimate cost that limits quality. This ultimate cost takes into account the first cost of the steel, and the difficulty in manipulating and machining the same. True, it is never necessary to use steel better than the work demands, but experience so far has not rendered it possible to decide that the materials used in motor cars were better than they should be.

At all events it does look as if the end will be towards a class of steel that will lend itself to heat treatment, to impart the several desired qualities, and in this steel the chances are the carbon content will be very low, indeed. It is not to the interests of the fabricators of steel to hasten this time, because the lower the carbon the quicker will the linings of the converters and the furnaces burn out, and the fabricators of steel will not advocate a process that ends in any extra cost to them. It might be argued they can charge for the extra cost, due to the high heat, in the absence of carbon; but on second thought, it is to say they cannot charge more than they do, unless the tariff is increased, because they now charge on a basis of the cost of the imported article, which includes the tariff and the transportation.

Any increase in the cost would enable one to import the steel at a saving, and it goes without saying that users of steel would take advantage of a possible saving. At all events, if the builders of motor cars want steel with low carbon, they must decide for themselves as to the reasons. If low carbon is desirable, the steel so constituted can be had from abroad if not from the home mills. Since mild steel—steel with very low carbon—will stand even abuse in the heat treatment thereof, it is a good product to consider, even if alloying elements have to be introduced to impart the desired "tensity." It is the low carbon steel that has to be used if "cementing" is resorted to, and it is certainly possible to realize great dynamic ability in the absence of carbon. It is a question if dynamic ability is characteristic of any grade of steel, if the carbon content is pronounced, even though the steel be alloyed.

The claims of dynamic ability for vanadium steel, for illustration, do not hold at all, if the carbon is high; who will say it is not the absence of carbon rather than the presence of vanadium that imparts the so-called dynamic qualities? At all events, when the smoke of battle lifts, the author is of the opinion that the "old wagon maker" with his—very low carbon iron, came very near to knowing what constituted the maximum endurance, the greatest ease of working and the uniformity so much to be desired in work of the sort under discussion.

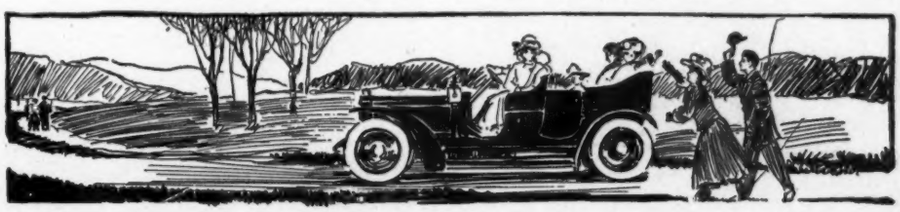
The illustrations accompanying this article are micro-photographs of Bishop soft chrome nickel steel, and are offered with the idea of showing by means of micro-photographs that in heat-treating steel does undergo structural changes, and it is reasonable to assume that the physical properties will be influenced by these changes. As a matter of fact there is a marked difference in the physical properties of the steel according as the structure is altered by the treatment, as the following tabulation will show:

Fig. 1. The properties of fabrication.

Fig. 2. Normal steel, the physical properties of which are as follows:

Tensile strength, 110,000 per square inch;

Elastic limit, 100,000 per square inch;



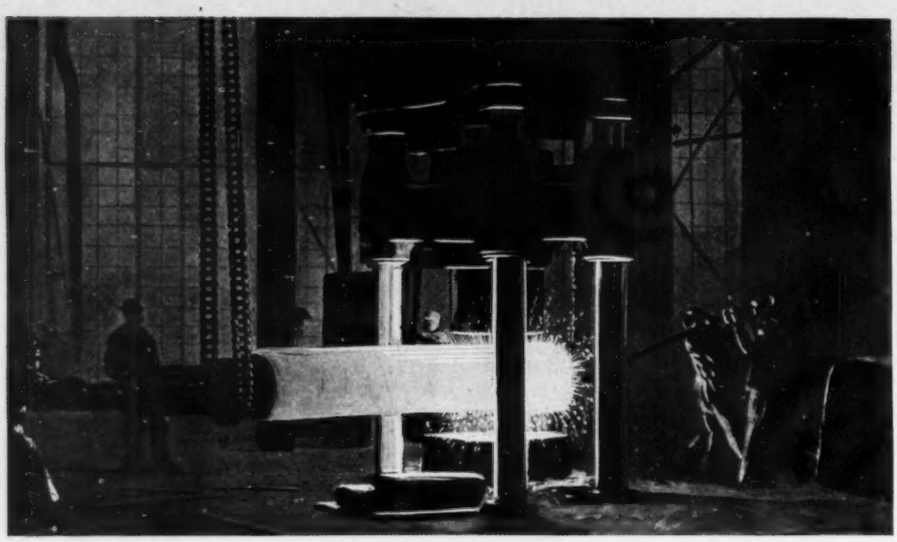


FIG. 1—THE FABRICATION OF STEEL

Elongation, 20 per cent in 2 inches;
Reduction of area, 60 per cent.

Fig. 3. Annealed steel, the physical properties of which are as follows:

Tensile strength, 108,000 pounds per inch;

Elastic limit, 104,000 pounds per square inch;

Elongation, 24 per cent in 2 inches;
Reduction of area, 69 per cent.

Fig. 4. Tempered steel, the physical properties of which are as follows:

Tensile strength, 200,000 pounds per square inch;

Elastic limit, 164,000 pounds per square inch;

Elongation, 5 per cent in 2 inches;
Reduction of area, 25 per cent.

Fig. 5. Core of cemented steel, the physical properties of which are as follows:

Tensile strength, 222,000 pounds per square inch;

Elastic limit, 214,000 pounds per square inch;

Elongation, 12 per cent in 2 inches;
Reduction of area, 56 per cent.

Fig. 6. Armor of cemented steel, the physical properties of which are as follows:

Tensile strength, 350,000 pounds per square inch;

Elastic limit, 290 pounds per square inch;

Elongation, 3 per cent in 2 inches.
Reduction of area, normal.

Fig. 7. Special treatment, the physical properties of which are as follows:

Tensile strength, 135,000 pounds per square inch;

Elastic limit, 120,000 pounds per square inch;

Elongation, 18 per cent in 2 inches;
Reduction of area, 65 per cent.

Obviously this steel could only be worked in its annealed state and only then with machine tools of considerable rigidity, using high tungsten steel for the cutters. It is used for the most responsible parts in the absolutely high grade motor cars, and its presence to any considerable extent is the natural indication of high first cost.

Records of actual failures are, of course, more valuable than suggestions of how to succeed. On the other hand, one does not like to brag about one's failures; the fact remains, to succeed with heat treatment it is necessary to select the steel, in view of the requirements. The best way, perhaps, would be to get acquainted with regular brands of steel and use them for the purpose for which they are supposed to offer advantages.

Chrome Nickel Forgings Too Hard

There is one other matter of the greatest importance to be mentioned ere this subject is closed out. It is known that chrome nickel steel, if it is forged after it is received from the mill, is rendered more or less hard and unmanageable. It is a fact that the vendors of the same steel can make forgings of the same material and they will be quite as soft as the round bars; why? It is a question that has puzzled most of us for many a day. We even went so far as to persuade ourselves that the mills had a monopoly of brains.

What it looks like is a monopoly of cupidity; the mills do not deliver bar stock in the same shape or condition as the stock they themselves use in the forging process. The bars delivered are heat-treated; the stock they use is normal; result, they can make forging that will be soft enough to machine. The effect of the heat treatment is to render the bar steel more presentable. The same treatment renders the stock of no value as forging stock.

For forging work it would be better to order steel in the normal state, and if it is to be heat treated, perform that operation upon the finished articles. It must be remembered, however, the forgings must be annealed before machining, for two reasons, viz.: to render them soft for machining; to abort warping in the subsequent heat treatment.

It would be possible to heat-treat with less of warping, if the parts were annealed again after machining, but this is an ultra refinement. In the annealing process, if the forgings are to be soft it will be necessary to proceed thus: 1—apply the initial heat by means of a wood fire, to avoid any but a gentle heating of the steel until the metal is warmed up; 2—then heat slowly and uniformly in a suitable furnace, up to the forging temperature; 3—commence forgings at once, do not allow the steel to soak; 4—forge continuously, until the steel reaches the low forging limit; 5—if the desired shape cannot be had by that time, heat again to the high forging limit in the same slow and even manner; 6—continue to forge without allowing the steel to soak, forge until the low forging limit is reached—if necessary repeat; 7—allow the forgings to cool slowly in lime; 8—anneal at temperatures between 870 and 1,000 degrees C., depending upon the composition of the steel—900° C. is the most used temperature; and, 9—double anneal if the steel is persistent in its hardness.

Forgings for Machining

The forging limits of heat will lie between 965 and 678 degrees C. The quality of the forgings will always depend upon the work put upon them. If they are not worked down to the low limit of forging the grain will be coarse and open. If the steel is heated to a point far above the high limit, the structure will tend to be crystalline. If the steel is heated unevenly and not through, the result will be a bruised fabric. Persistent hardness is to be dreaded, and it will follow if the steel is not properly forged. In that event, annealing will not accomplish the desired end. These fabrics are prone to hold to their habitual allotropic state and that is not the state, *alpha*. If the steel holds to the *beta* state of allotropy, it will be brittle; if, on the other hand, the *gamma* allotropic state obtains, the steel will be hard.

The higher the carbon the more is the likelihood of the steel to hold to its brittle or to its hard state. Alloy steel is the greatest offender in this connection. It is therefore a matter of skill in the light of knowledge, to succeed in rendering forgings soft to machine, after going through a forging process.

If, on the other hand, the steel is oil-treated at the mill before it is forged, there is no chance at all of being able to make the forgings soft enough to machine, commercially. If the user of steel demands the properties of oil-treated chrome nickel steel, they must, of course, put up with the consequences. It is not then the

fault of the manufacturer of the same.

The normal chrome nickel steel will not look nearly so good as the same after heat treatment, and it is possible the manufacturers were compelled to resort to treatment before delivery, in order to be able to sell the steel. It was not so long ago that impossible values were demanded—and advertised—values, in fact, only to be had if the steel were oil quenched and but partially let down. Of course such products were difficult to machine, and if forged, even refused Novo Steel cutters, in the hands of men of much skill.

In conclusion of the subject, there is at least one other matter that should have some attention at least; that is to say, the variety of brands of steel should be limited in so far as it may be possible to do so.

One Grade of Steel Is Best

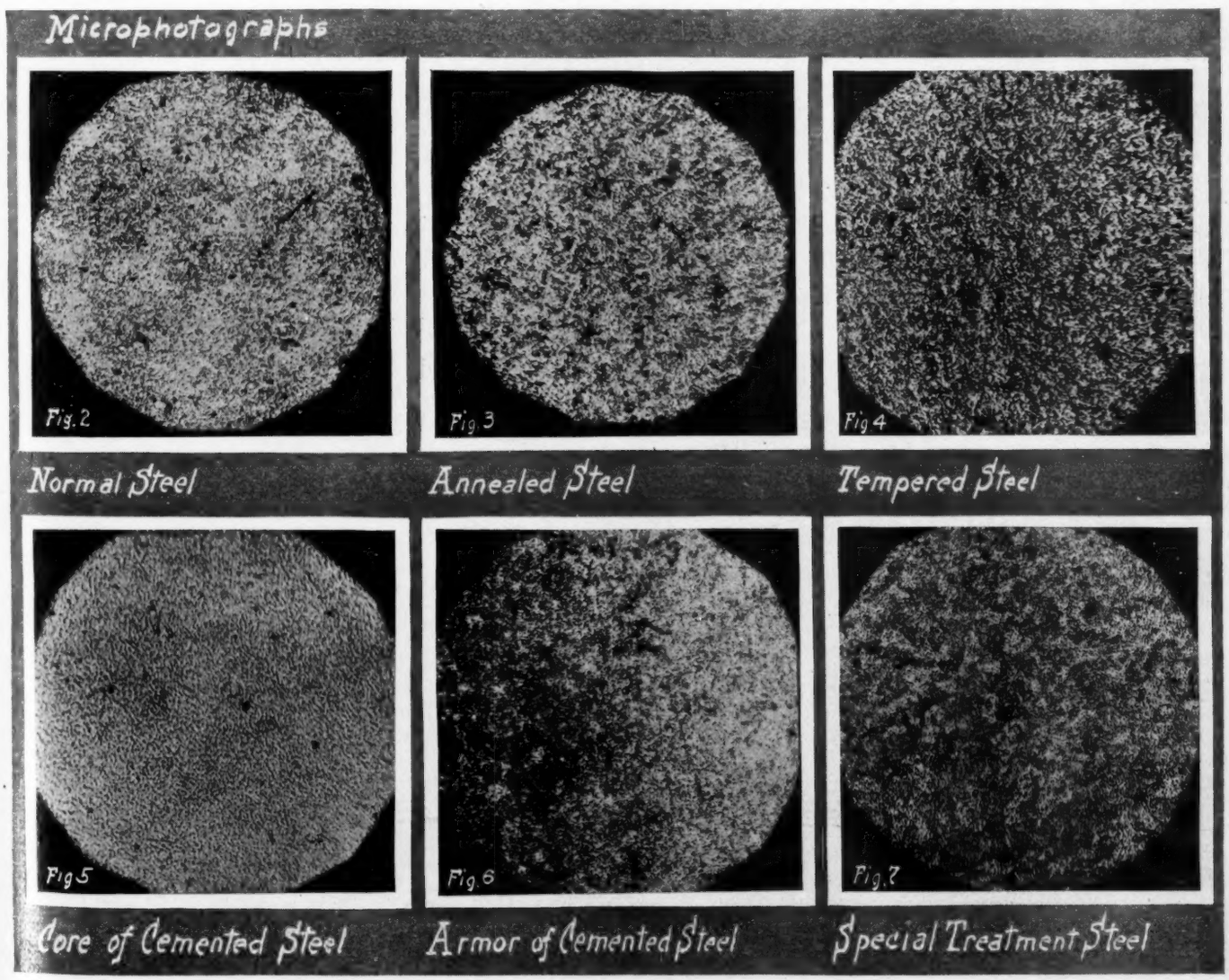
If all parts of a car could be made of a single brand of steel the better would be the results, all things considered. The builders of the cars would be able to take a greater advantage of the influence of quantity in purchasing the steel; the artificers would attain a greater knowledge of the steel, and the user of the car, in each case, would have less trouble in his quest for suitable repairs.

Theoretically, it is possible to provide all the desired qualities in steel, using a single grade of the same. This is not to say the grade in question would have to be some fine and rare brand of steel; indeed, the product would have to be either a very near approach to iron or the ingredients placed to impart hardness would have to be anything but carbon.

AVERTING INNER TUBE BLOW-OUTS

The novice seldom realizes the importance of not allowing an inner tube the smallest crack through which the air pressure can force it. Such a crack may be afforded not only by a raised inner edge of the shoe, as was mentioned in these pages a few weeks ago, but by a misplaced or bent tire bolt. If such a bolt or lug is bent close to its head, the latter will not seat itself squarely inside the shoe. The same is true if the bolt is not of the proper size for the tire used. In case a bolt breaks and no new one is at hand, the hole in the rim through which it passed, must be covered by a strip of the heavy canvas ordinarily included in the tire repair kit. This strip may be cut 1½ inch wide, and long enough to go clear across the inside of the rim and project ¼ or ⅜ inch at each side. It will be held in place by the air pressure acting against the beads of the shoe. Unless a new bolt is to be put in place almost at once, the hole through the felloe might, to advantage, be plugged with a bit of chewing gum, to exclude water. In driving with one or more of the bolts missing from any of the tires, it must be remembered that the bolts are largely relied on for holding against centrifugal force on taking corners. Nevertheless if the bolt is not a fit it is much safer to take it out altogether and cover the hole as described, than to take chances on a badly-fitted bolt.

The leather treads of most non-skid tires have joints whose ends are cemented together. If the tire is so put on that the overlapping end of this joint runs against the wheel, the joint will tend to loosen much sooner than if it runs with the wheel. This applies to both front and rear tires.



MICO-PHOTOGRAPHS OF ENDS OF BROKEN STEEL BARS, SHOWING EFFECTS OF HEAT TREATMENT

Gaeth Car Line for 1909

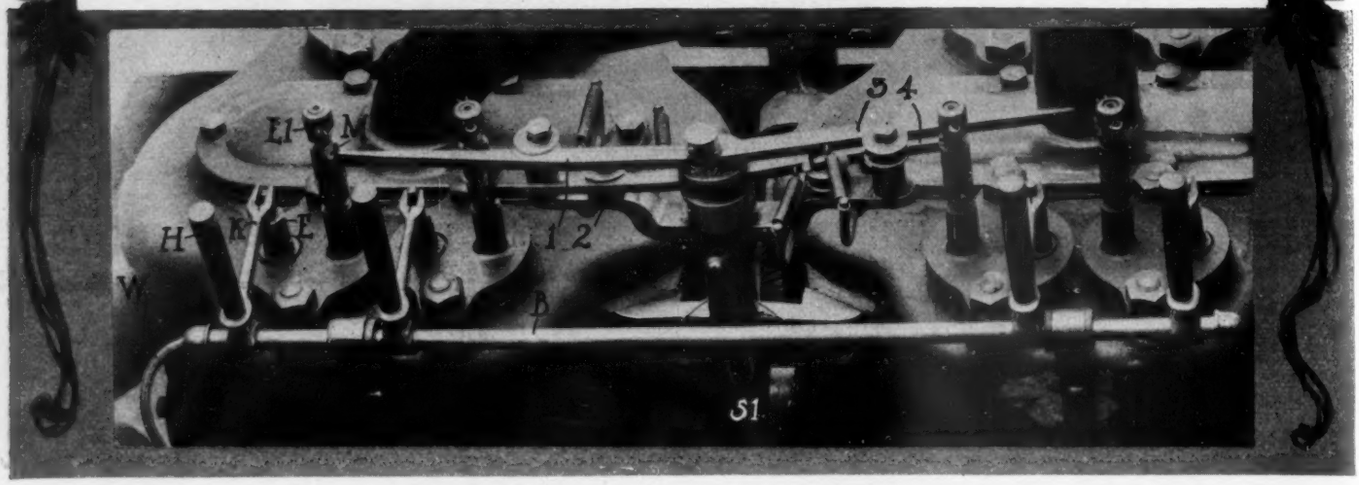


FIG. 1—TOP OF GAETH MOTOR SHOWING LOW-TENSION IGNITION PARTS USED AND METHOD OF OPERATING THEM

MOST conspicuous in the 1909 Gaeth cars, built by the Gaeth Automobile Co., Cleveland, O., is the use of a make-and-break ignition scheme, unique in its design; the employment of thermo-syphon cooling, and a leather-faced contracting-band clutch. Paul Gaeth, whose energies and inventiveness have brought the car to its present status, has used these slightly out-of-the-ordinary tendencies for several years, and the 1909 car is a development of the 1908, rather than a trying out of new constructions.

Perhaps nothing is more interesting about the car than the make-and-break system of ignition illustrated on this page. The make-and-break parts are located in the tops of the chambers carrying the intake valves, and are all driven from a single vertical shaft S1, Fig. 3, which takes its drive from the intake camshaft through spiral gears, the gear on the camshaft being mounted to slide back and forth along the shaft to vary the timing. This is accomplished by a two-piece bronze sleeve secured over the camshaft and which bears in a groove in the end of the sliding gear. By connecting this sleeve with the lever on the steering wheel, it is possible by manipulation of this lever to slide the sleeve and gear along the shaft, advancing or retarding the timing by changing the relative rotation of the camshaft and the vertical shaft.

So much for that part of the ignition device carried within the crankcase; next comes the external parts carried on top of the cylinders. The current from the low-tension Bosch magneto is led through a wire W, Fig. 1., to the bus bar B from which are four knife switches K with handles H for delivering the current to the stationary electrodes E, which enter the top of the combustion chamber. The moving electrode within the combustion chamber is on the bottom of the rocking electrode E1, and in making and breaking the circuit a brief oscillation is imparted to the electrode E1, so that the hammer at its lower ends is carried to and separated from the stationary. This rocking is accomplished through a series of four push-rods, 1, 2, 3, 4, one for each cylinder, and the operation of which is as follows: To the top of the vertical shaft S1, already referred to, is attached a pair of small cranks, to which are attached these push-rods, the tripping action as well as the timing of the engine is regulated by four small eccentrics, against which the push-rods are held by coil springs. The ends of the push-rods bear upon short arms M, on the rocking electrodes, and by pushing outward on these make contact within the combustion chamber and as soon as they slip off the ends, or trip, springs throw the contact arms of the electrodes away from the stationary electrodes E, thus breaking the circuit. The stationary and rocking electrode for each cylinder are secured in a removable plate, held to the top of the valve chamber by a pair of studs. The simplicity of this make-and-break means is one of the features in that there is only one driving member in the shaft S1 from the camshaft to the motor.

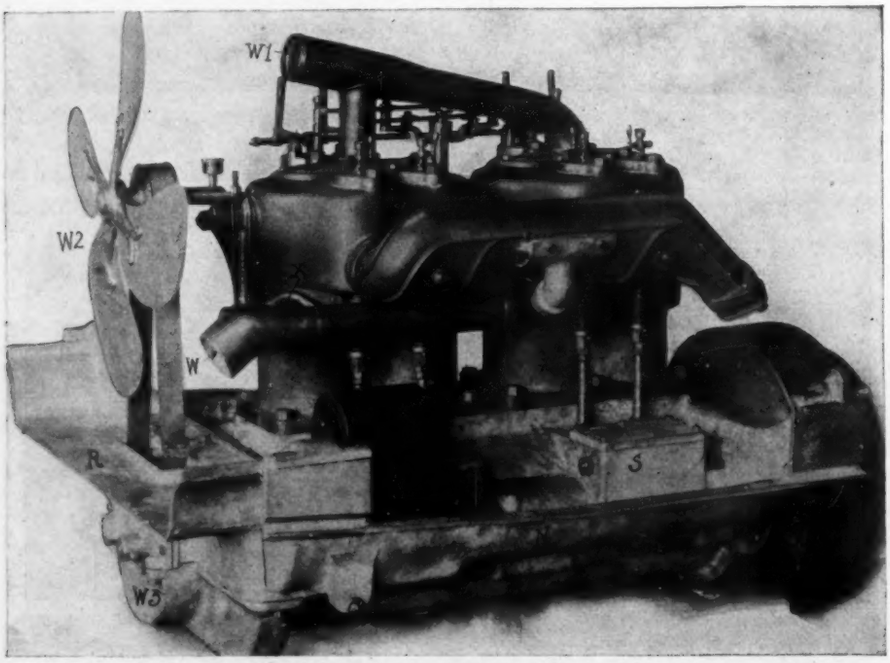


FIG. 2—GAETH MOTOR SHOWING THERMO-SYPHON COOLING MEANS

Gaeth Thermo-syphon Circulation

The Gaeth system of thermo-syphon circulation is a very conventional one, illustrated in Fig. 2, consisting of a large-diameter intake pipe W, with a short branch X to the front cylinder casting, which enters the casting at the corner, instead of between the two front castings. The main pipe also enters the rear cylinder casting at the corner instead of between the cylinders. The water flow,

because of this piping, reaches the cylinders at practically the hottest parts, mainly beneath the exhaust valves, and the return flow is through the large varying diameter pipe W1, which attaches to plates forming part of the jacket head, and which permit of removing all core sand from the casting. Closely associated with this thermo-syphon circulation in conjunction with the honeycomb radiator is the use of a belt-driven fan W2, driven from the forward end of the crankshaft and having the pulley entirely enclosed within the compartment W3 which is formed integrally with the main aluminum casting of the motor. Fan blades in the flywheel are not used.

Features of Gaeth Crankcase

The Gaeth crankcase is a carefully-worked-out affair, as can be seen from both motor illustrations. In the first place, an integral aluminum web N is cast on both sides between the supporting arms, thereby eliminating the necessity of a mud apron beneath the motor. On the forward end is a bed piece R, for supporting the radiator, and the halftime gears are entirely encased. The magneto, on the left side, sits well to the front and its shaft is completely housed in the forward compartment. Opposite each cylinder casting is a box-like expansion S, which contains horizontal lever arms, pivoted at one end and resting beneath the valve stems at the other, while the camshaft bears upward against their centers, the object of it being that the cams bear upon these levers instead of directly against the bottom of the lifter rods. On the top of each compartment is a removable plate, affording complete access to these parts as well as to the cams without disturbing any of the other motor parts. On the intake side of the motor the same lever compartments appear. Apart from these crankcase peculiarities the motor is a conventional design with opposite valves, a very large-

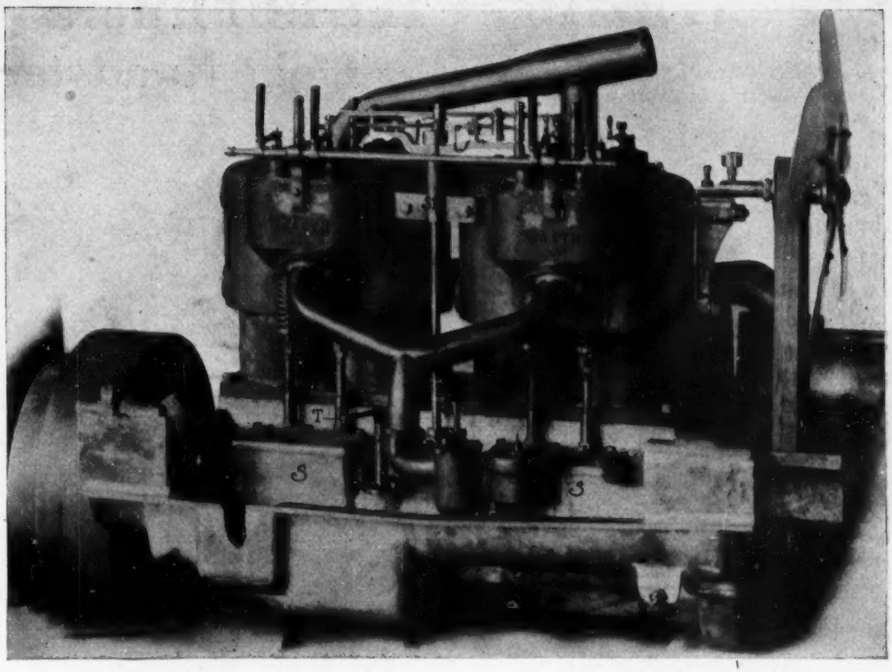


FIG. 3—SHAFT S1 DRIVES THE GAETH IGNITER PARTS

ribbed exhaust manifold, and a moderate sized intake pipe. An adjustment is provided for retaining the tension of the fan belt by slotting the supporting bracket.

Gaeth Makes Own Carbureter

The carbureter employed is manufactured at the Gaeth factory and is featured by a three-fold control, accomplished by one movement of the throttle, which control consists of regulating the entrance of the air at the bottom, regulating the quantity of gasoline into the nozzle, and regulating the passing of the mixture to the cylinders, the leverette on the steering wheel controlling all three. The separate float chamber is the frontmost piece and behind it comes the vertical mixing chamber, completely filled by the revolving needle valve and throttle. In the base of the throttle are two radial V openings for regulating the air entrance, and in its side is an opening for controlling the exit of the mixture. When this throttle is rotated to control the air and mixture, a part rotation of the needle valve is effected, so that with a larger air entrance there is a greater flow of gasoline. The common auxiliary air valve is not used. Lubrication of the motor rests with a four-feed gear-driven oiler which delivers its supply to the four cylinders of the crankcase. Above all of the motor bearings are pockets for collecting the splash and with outlets to the bearings beneath.

Clutch Contracting Band Type

The clutch belongs to the contracting band genera, in which a flange cast integral with the flywheel affords the friction surface over which the leather-faced band contracts in obedience to the pressure applied to a pedal. From the clutch to the sliding gearset is a short drive, while the sliding gear itself affords three forward

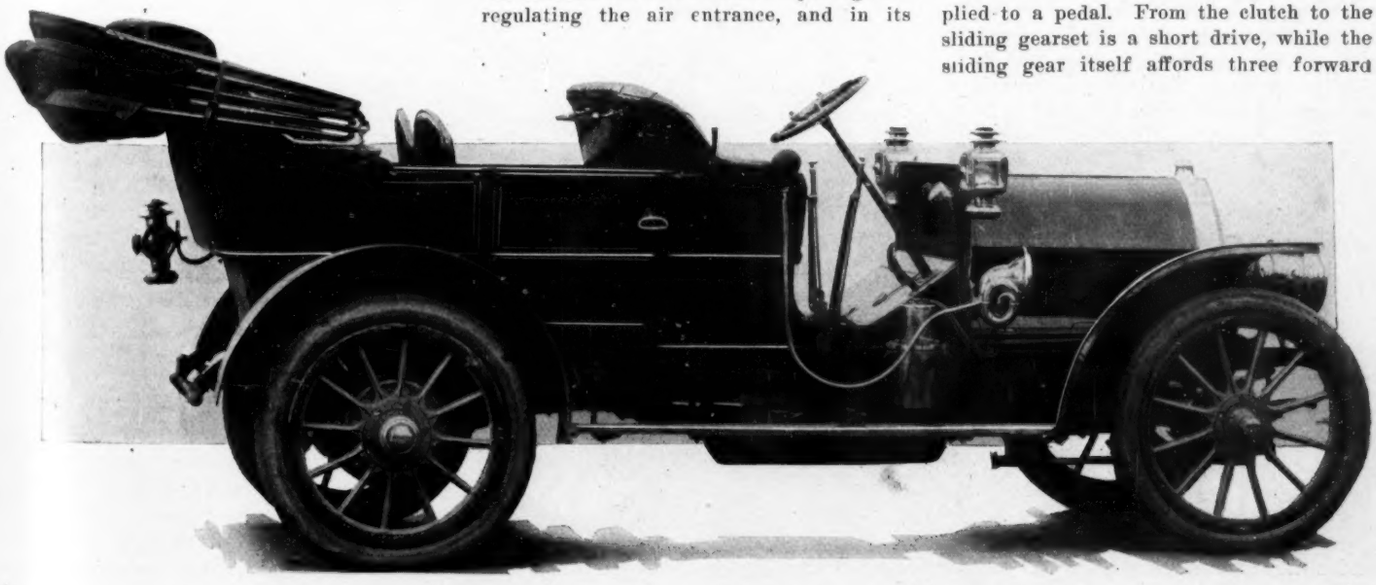
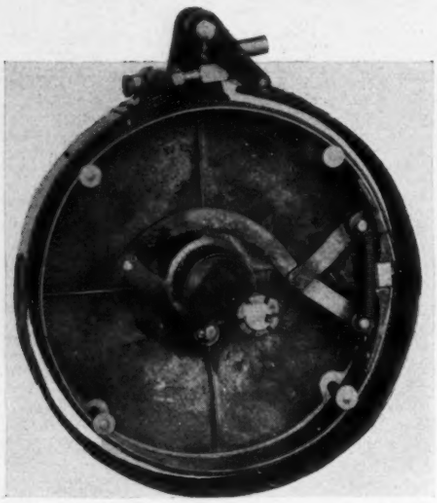


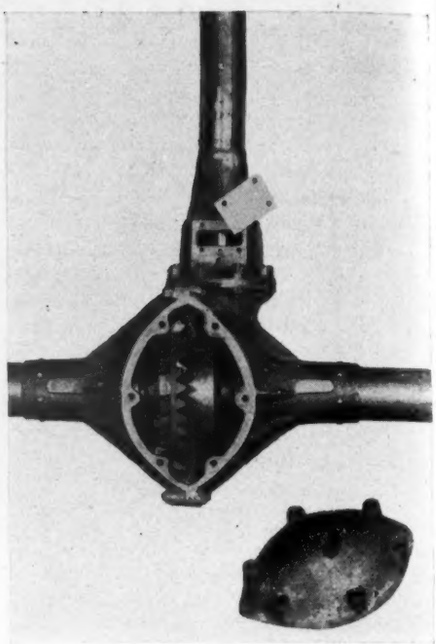
FIG. 4—THE GAETH SEVEN-PASSENGER CAR FEATURED BY LOW-TENSION IGNITION

The 1909 Mora Light Roadster

THE MORA STEERING GEAR



INTERNAL AND EXTERNAL MORA BRAKES



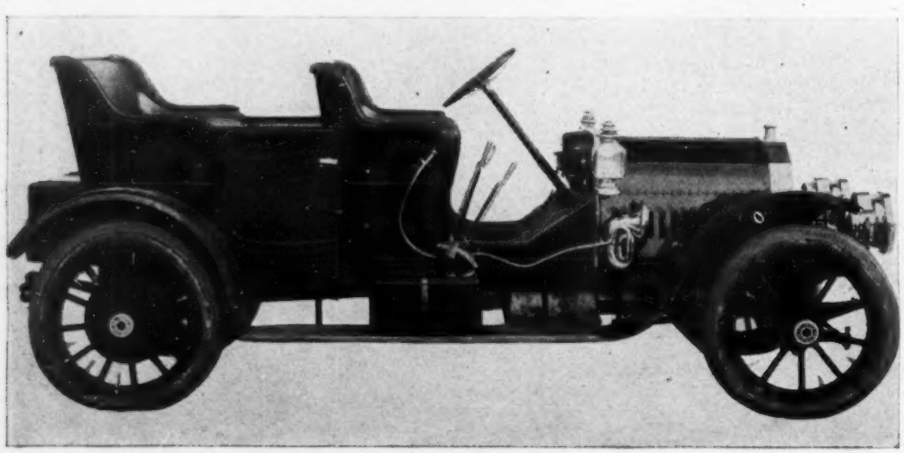
MORA DIFFERENTIAL DESIGN

speeds and reverse, operated on the progressive system. The speed change lever is fitted with an automatic position finder and eliminates any chance of missing. From the transmission gear to the live rear axle the propeller shaft is normally without angularity, and the universal joints are protected from dust. The rear axle itself is of the floating type, with ball-bearing wheels mounted on the axle casing.

The chassis frame is a channel section of pressed steel and free from any offset It is suspended on semi-elliptic springs, front and rear, of silico-manganese steel, taking advantage of the requisite number of comparatively thin leaves or plates, hence the springs are long, flat and flexible. They are enormously strong for the work, and the periodicity of the body oscillations is fixed within the limits that assure easy riding qualities. The spring linkages and other chassis frame details are in strict accord with the refined design in general. The steering gear is of the nut-and-screw type, designed to be irreversible. A dustproof housing is provided and the working members are submerged in grease. The steering wheel is without lost motion and after long service, such lost motion as may be due to legitimate wear, can be eliminated by the adjustments afforded. These cars will be built in open passenger styles, runabout and limousine lines, all using the same wheelbase and chassis details. The company also markets a commercial car.

GAETH SPECIFICATION

Horsepower—35-40
Cylinder bore—4⅞
Cylinder stroke—5¼
Wheelbase—114 inches
Front tires—36 by 4 inches
Rear tires—36 by 4½ inches
Cooling—Thermo-syphon
Ignition—Low-tension Bosch magneto
Clutch—Leather-faced contracting band
Transmission—Sliding, three-speed
Springs—Semi-elliptics, front pair 44 by 4 inches, rear pair 50 by 2 inches.
Front axle—I-beam
Rear axle—Ball-bearing, floating type
Body types—Seven-passenger tourist, short couple body, tourabout and limousine



FOUR-PASSENGER MORA ROADSTER WITH BAGGAGE TRUNK

ONE of the leading 1909 models of the Mora Motor Car Co. is its light four car with close couple tonneau body accommodating four adults and baggage trunk in the rear. This car incorporates the majority of the Mora constructions, including the continuous aluminum pan support of the motor and transmission, uniting these two in a unit construction. The car, however, makes use of a pressed steel frame, which is dropped in front of the rear axle, thereby permitting of the use of platform spring suspension with good flexion range.

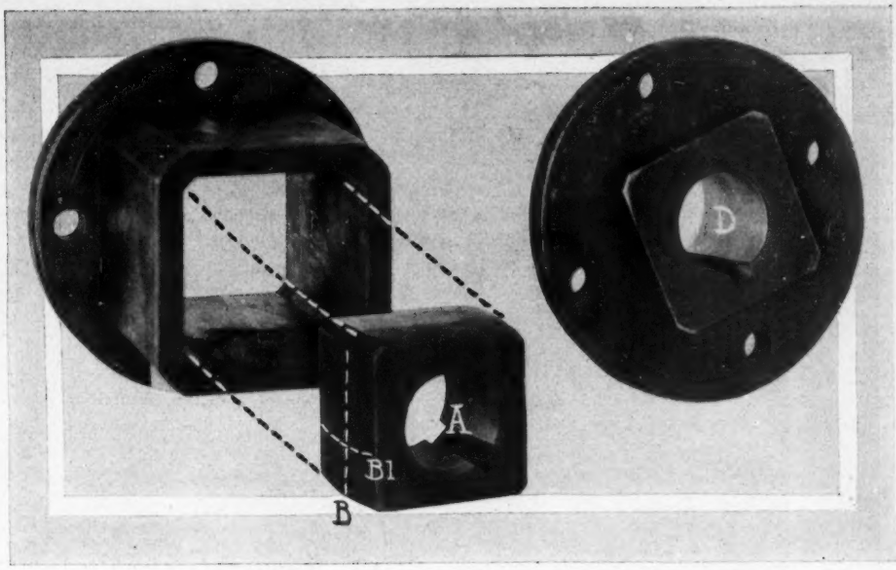
The Mora motor is a four-cylinder four-cycle power plant, the twin cylinder castings with intake and exhaust valves being on the left side, while the three-bearing crankshaft is carried on the lower part, or bed plate of the motor instead of as in the conventional type being suspended from the upper half. Motor Age readers are familiar with this pan construction, which, throughout its length, bolts direct to the side members of the frame, thereby serving reciprocally to reinforce the casting as well as the frame. The motor, with 4-inch bore and 5⅛-inch stroke, has a 25.6-horsepower rating. On the left side are the intake and exhaust manifold, the water pump and the carbureter, together with both sets of valves. Lubrication is by splash, with oil fed from a pressure oiler through two sight feeds on the dash, one passing to each of the crankcase compartments. The third sight feed, which ordinarily remains closed, if opened wide increases the oil level in the crankcase when exceptionally heavy road traveling is encountered. Stability throughout the motor is evidenced in many respects, one being the employment of 10⅛ inches of bearing surfaces for the crankshaft distributed as follows: flywheel end 4 inches

in length, and middle and front bearings 3⅛ inches each.

Cooling, Carburation, Ignition

The cooling, carburation and ignition systems arranged around the motor are standard in every respect. In the cooling department is a water pump on the left front, accessibly located on the motor arm, with the hose from the radiator entering beneath the base casting, as indicated at W, and the water pipe W1 from the pump passing in front of the forward cylinder to the right side, where it enters the waterjacket. The top of each twin-casting jacket is an aluminum plate, formed integrally with which is a T-piece Q, to which connects the hose H between the castings and the other hose H1 leading to the radiator. Mixture is furnished by single nozzle concentric float carbureter, in which the regular air supply passes through holes in the side of the nozzle chamber. A cylindrical shutter may be operated to close these holes for starting. Additional air is admitted by a mushroom valve. The regulation equipment is a storage battery and four-unit coil, connected up with the timer carried at the front end of the motor and on a level with the cylinder heads; but, an addition of $150 on the price gives a complete double system of two sets of plugs, one of the systems being the battery coil timer combination, and the other an imported high-tension magneto.

So closely are the clutch and selective gearset associated with the motor, because being a unit with it, that they are inseparable in many respects. This is particularly the case in assembling it, in which the shafts of the gearset are lined up with the motor crankshaft by fitting in ways, machined in the rear end of motor part of aluminum pan, the part supporting and forming the lower half of the transmission set. By this construction it is impossible for the transmission and motorshafts to be out of alignment. The clutch, a leather-faced cone member, carried within the flywheel, is completely protected by an expansion part of the aluminum under pan, in which is a removable plate, or cover piece.

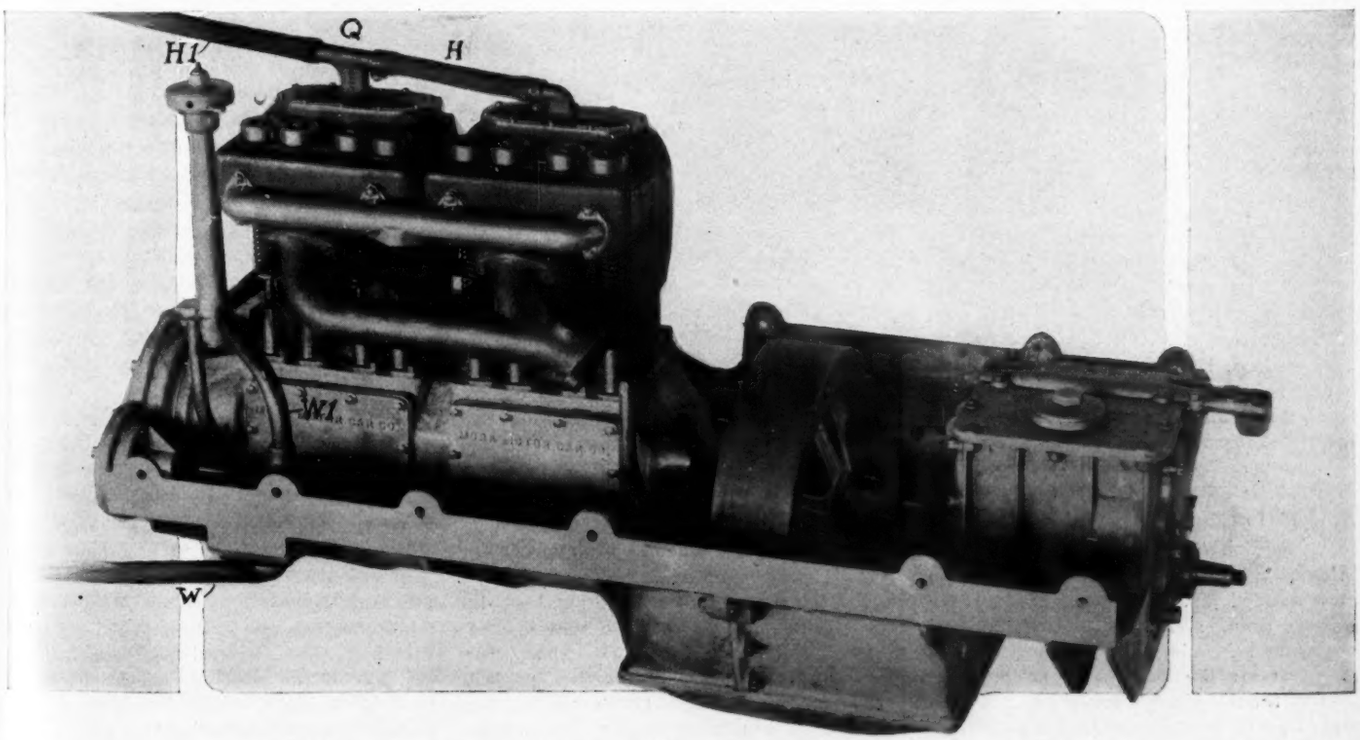


MORA UNIVERSAL JOINT IN REAR OF GEARSET

Driveshaft Enclosed in Tube

From the gearset to the rear axle the driveshaft is enclosed in a tube, so that the ordinary torsion bar system is eliminated. At the forward end is a special type of universal joint consisting of a hardened steel block A made square in the direction of rotation B, but rounded fore and aft, as indicated by arrow B1. This block slides in a square hole in a hardened steel casting fixed to the chain speed gearshaft. The rear axle has the driving bevels mounted on ball-bearings, and a special adjustment of the bevel pinion is provided. Brakes acting on drums 14 inches in diameter are furnished, one set being of the expanding type, the other contracting, and both faced with fabric.

In the running gear, use is made of an I-beam front axle, with jaw ends; front springs are semi-elliptics, rears of the platform type, the wheelbase measures 110 inches and 32 by 4-inch tires are used. A point in the control of the car is the interconnecting of the hand brake and clutch.



THE MORA UNIT MOTOR AND GEARBOX PLANT, CARRIED ON UNIT ALUMINUM BED PLATE

FROM the FOUR WINDS

NOTABLE GROUP OF DRIVERS AT DINNER GIVEN BY FIAT AUTOMOBILE CO. IN HONOR OF LOUIS WAGNER

Seated, from left to right—Nazzaro, Fiat, third at Savannah; Wagner, Fiat, winner; Hemery, Benz, second. Standing, from left to right—Piacenza, Itala; Cagno, Itala; Robertson, Locomobile, Vanderbilt cup winner 1908; de Palma, Fiat, fastest lap at Savannah; Duray, Lorraine-Dietrich; Seymour, Simplex; Szisz, Renault; Hanriot, Benz; Rigal, Bayard-Clement; Hautvast, Bayard-Clement.

Springfield in Market—The board of public safety at Springfield, O., has requested the city council to appropriate $2,000 for the purpose of purchasing a motor car for the use of R. E. O'Brien, chief of the police department. The board also plans to buy a car for the use of Fire Chief Samuel Hunter.

Favors Turnpikes—The Confederated Civic Improvement and Protective Association, composed of prominent Baltimore countyites, passed a resolution favoring the construction and maintenance of all turnpike roads that can be acquired by the state without cost leading from Baltimore city into the county. The countyites believe that if this is done it will create a sentiment that will guarantee another appropriation by the legislature in addition to the $5,000,000 already allotted or the building of good roads.

New Roads Located—Roads in Anne Arundel county, Md., have been definitely located by the state highway commission and tentative routes in Allegany and Garrett counties selected. The definite route for Anne Arundel county follows: Main road—Starting at the Calvert county line, near Owings, by way of Birdsville, South River bridge and Parole to Annapolis; from Annapolis and Parole, going west over the same route to a road 3 miles west of Parole and then northerly by way of Crownsville, Gate, Waterbury, Severn, Benfield to Glenburnie, to Brooklyn, and entering Baltimore city by Light street bridge. Several cross-county routes were also decided upon. Tentative route for Garrett county: From Oakland, via Bettinger and Jennings, to Grantsville, and from Grantsville over the old National pike to the Alleghany county line. A road from Grantsville to the Pennsylvania state line running over the old National pike will also be built. Alleghany route—From the Garrett county line over the National pike via Frostburg, Cumberland and Flintstone to the Washington county line.

Pierce Tire Economy—A report just made to the George N. Pierce Co., of Buffalo, by Don Cole, who has had a six-cylinder 36-horsepower car on the road in various parts of the country recently, shows that up to December 1 the car had covered 4,563 miles with the original air still in the tires. During the entire time the car was on the road it was used for demonstrating purposes.

Fiat Drivers Banquetted—The Fiat Automobile Co. gave a dinner December 2 in New York city in honor of Louis Wagner, winner of the grand prize at Savannah, Ga., and his team mates, Felice Nazzaro and Ralph de Palma. All of the foreign drivers in the city at the time, most of whom were to sail for home the next day, were present, included in the number being Hemery, Duray, Rigal, Szisz, Hautvast, Cagno, Fournier, Piacenza and Hanriot. Among the distinguished guests in attendance were Signor G. Coltelletti, delegate to the race from the Royal Italian Automobile Club; Cesare Conti, the Italian banker; L. Barzini, of Milan, Italy, the correspondent who accompanied Prince Borghese on the memorable trip from Pekin to Paris; Victor Breyer, of L'Auto, Paris, and Robert Lee Morrell, chairman of the contest committee of the Automobile Club of America. Russell A. Field acted as toastmaster. The spirit of the speechmaking in Italian, French and English was one of congratulation to the Fiat company for its victory and praise for the perfect handling of the race at Savannah, the foreign drivers being equally as enthusiastic as the Americans on the latter point. The drivers from across the water also expressed a desire to come back again next year. Before the dinner the Fiat company presented Wagner, as a reminder of his victory, a solid gold hunting case watch suitably inscribed.

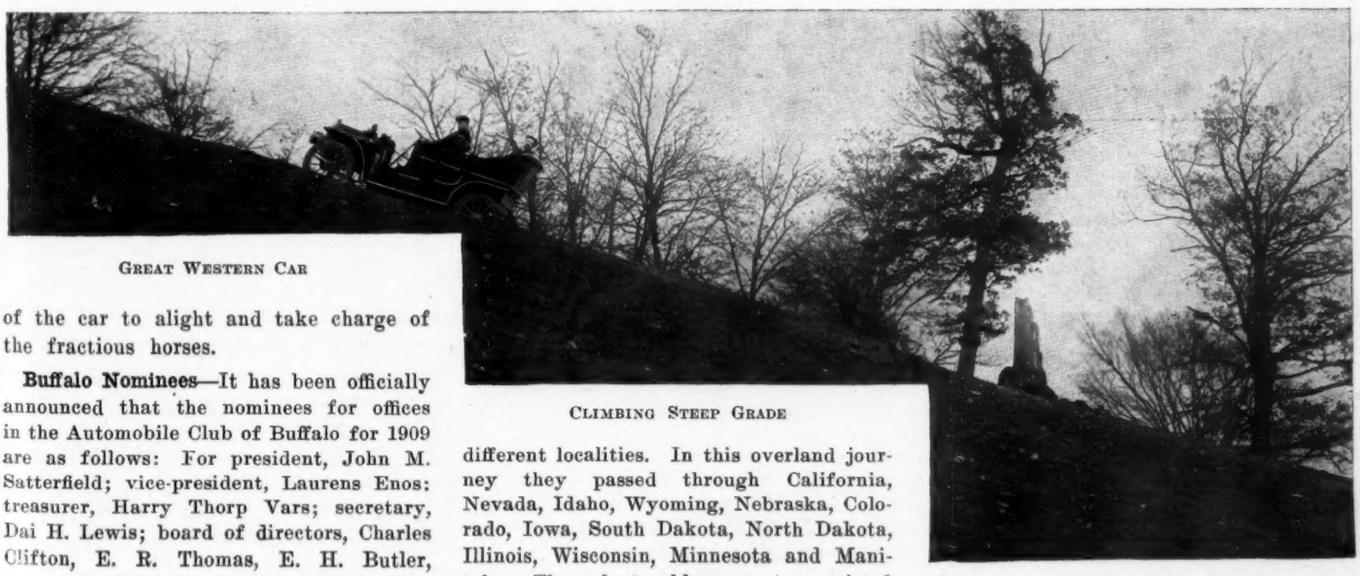
Colored Chauffeurs Organize—The colored chauffeurs of Boston have formed an organization to promote better feeling among the drivers, give mutual aid when necessary, and in other ways make the drivers of cars more efficient. At the last meeting the temporary organization was made permanent with the election of the following officers: Robert W. Maxwell, president; Edward Mason, vice-president; J. A. Oliver, treasurer; Eugene Michaels, secretary; W. P. Ford, assistant secretary. Meetings are to be held twice a month and it is proposed to have prominent motorists address the members on different topics, all of which will be chosen from the viewpoint of a better understanding of motor cars and their operation.

Show Peace in Detroit—After several conferences and elaborate negotiations, the two rival show organizations in Detroit have gotten together and the announcement is made from both headquarters that there will be but one exhibition in the city this winter, this being the event to be conducted under the auspices of the Detroit Automobile Dealers' Association the week of February 15. The final settlement of the case occurred when Secretary McMaster, of the Tri-State Automobile and Sportsmen's Show Association, wrote to Manager E. LeRoy Pelletier, of the D. A. D. A., several days ago, informing him of the intention of the Tri-State to hold no show. Both President W. E. Metzger and Vice-President Lewis, of the Tri-State association, have allied them-

selves with the D. A. D. A. for its show, which will be held in the new Wayne Casino and will also include exhibits of accessories, for which there is an abundance of room.

Bretton Woods Statistics—An interesting story is told by the registration of different makes of motor cars which have been driven by tourists stopping at summer hotels in the mountain regions. There were 1,159 motor cars at the Mount Washington garage, Bretton Woods, N. H., during the past season. Eighty-six different makes were represented. Of all these cars, 231 were Packards. The next greatest number of cars of any one make was 126.

Tradesmen Stop Runaway—The usual order of events was reversed a few days ago and a motor car brought into use for the purpose of averting what might have otherwise proven to be a serious runaway. Hugh Chalmers, president, and Leo Counselman, sales manager of the Chalmers-Detroit Co., passed through Toledo on their way from Detroit to Dayton. A farmer driving along the road was walking behind his rig in order to keep warm when the team suddenly took fright and dashed down the highway. The motorists seeing the farmer's plight speedily ran ahead of the team, gradually slowing down the horses until they were brought to a standstill. As there was but a narrow road the team had not room to get by it became an easy matter for the occupants of the car to alight and take charge of the fractious horses.



GREAT WESTERN CAR

Buffalo Nominees—It has been officially announced that the nominees for offices in the Automobile Club of Buffalo for 1909 are as follows: For president, John M. Satterfield; vice-president, Laurens Enos; treasurer, Harry Thorp Vars; secretary, Dai H. Lewis; board of directors, Charles Clifton, E. R. Thomas, E. H. Butler, George C. Diehl, James N. Byers, Maurice M. Wall and George P. Urban. The election of officers and annual meeting of the club will take place in Concert hall, located just across the hallway from the clubroom, on Monday evening, December 21. A luncheon and refreshments will be served. The board of directors of the club met recently and decided to increase the size of the board from nine to eleven members. The annual dues hereafter will be $6, for which the members will receive many privileges, including an interesting monthly publication from the club. This will be known as the Buffalo Motorist.

Club Garage Assured—The committee of the Automobile Club of Philadelphia which is at work on the "wind-raising" end of the new club garage project has met with such success that in its November report it practically assures the members that if the promises of support already given are continued proportionately a sufficient amount will have been pledged to warrant the beginning of work within a short time.

Lytle Improving—Friends of Herbert Lytle, who for several weeks has been lying critically ill with typhoid fever and pneumonia at Robinwood hospital, Toledo, will be pleased to learn that a change for the better was reported this week and that the great driver is now expected to recover. The attending physicians are much encouraged and feel that it is now but a question of time unless unforeseen complications should develop, which is not thought probable.

Lengthy Tour Made—Dr. E. E. Brown, formerly of Emerson, Canada, now a resident of Fort Bragg, Cal., recently drove a Rambler two-cylinder touring car from Fort Bragg to Winnipeg, a distance of 3,123 miles. Brown left Fort Bragg on the evening of July 22. His idea of traveling overland was merely to see the country. In the interim between July 22 and September 23, the doctor and party covered all kinds of country, camping in different localities. In this overland journey they passed through California, Nevada, Idaho, Wyoming, Nebraska, Colorado, Iowa, South Dakota, North Dakota, Illinois, Wisconsin, Minnesota and Manitoba. The only trouble en route consisted in the losing of the mud apron.

CLIMBING STEEP GRADE

Great Western As Hill-Climber—The city of Peru, Ind., in which the Model Automobile Co. is situated, is located in the Wabash river valley. Some of these hills are very sharp, grades ranging from 10 to 30 per cent and from 10 rods to 1,300 yards long. In order to test one of the Great Western cars recently P. L. Creighton and John E. Roper tried every hill in the vicinity. Then they opened a gate into a farmer's pasture where the hill forms the north bank of the Wabash valley and the grade is very acute. Notwithstanding the Great Western had no opportunity for a start, since a fence at the very bottom of the grade prevented, the car is said to have climbed this hill with the speedometer registering 14 miles per hour. In the center where the grade was steepest, the driver stopped the motor dead and then started on and finished the remainder of the grade with ease.

Chicago Motor Club Election—The members' ticket made a clean sweep in the Chicago Motor Club's annual election, the new officers being as follows: President, F. C. Donald; first vice-president, Charles P. Root; second vice-president, David Beecroft; secretary-treasurer, Frank H. Trego; directors, F. E. Edwards, Paul Picard, H. P. Branstetter, Louis Geyler and J. V. Lawrence; auditing committee, N. H. Van Sicklen, Jr., Frank Martin, O. G. Temme.

Tries Strang System—The Lehigh Valley railroad is experimenting with a new combination motor passenger car. In a recent test the car averaged 57 miles an hour over several stretches. The system is known as the Strang gas-electric, with storage batteries sufficient for a 20-mile run after the motor is put out of commission. The car is designed for passenger service on branch lines, where traffic is not sufficiently heavy to warrant the running of the usual trains except at a loss.

Grand Rapids Election—At the annual meeting of the Grand Rapids Automobile Club, of Grand Rapids, Mich., the following officers were elected: President, James R. Jackson; first vice-president, George L. Henzelman; second vice-president, Dr. F. C. Warnshuis; secretary, Dr. Willard Burleson; treasurer, Dr. D. Emmett Welsh. The officers and A. A. Barber will compose the board of governors. Mr. Jackson, the new president, is vice-president of the Michigan State A. A.

NEAR PERU, IND.

The Realm of the Commercial Car

ONE of the few cities in the United States to adopt the motor vehicle for the collection of mail is Indianapolis, where two Overland cars have just been placed in service. The service is an experiment, the use of the vehicles to be based on the success of the present test. It is announced that the two cars have been leased for 1 year, the manufacturing company to supply the drivers during that time. Regular routes, including the downtown districts and suburbs, are to be arranged immediately and a careful record kept of the cost of the service and time made. While the routes have not been settled upon, one of the cars covered a route formerly covered by a horse-drawn wagon in 3 hours, in a little less than 2 hours. Another advantage in favor of the cars is said to be the fact that they can be in service night and day. The cars were built from a special design and are very attractive in appearance. A regular model No. 32 Overland chassis was used and on this was built an enclosed body. There is a hood top in front for the protection of the driver. On each side, about the middle of the body, is a sliding side door for the accommodation of the mail carrier. About half of the body is of wood, the upper part being of heavy screen wire, covered with canvas. It is painted red, white and black with gold lettering.

TWO OVERLANDS USED BY INDIANAPOLIS POSTAL AUTHORITIES FOR COLLECTING MAIL

ORDER FOR FORD TAXICABS

It is unofficially announced from the factory of the Ford Motor Co. that orders have been received for 300 of the firm's laundaulets, to be sent to St. Petersburg, and 150 more for Berlin, the cars to be equipped with taxicab paraphernalia and used for this purpose in the European capitals mentioned. The Ford people admit that they regard the taxicab market as well worth further development. The firm's factory in Highland Park is rapidly nearing completion and an enterprising real estate agent has opened up a subdivision across the street on which it is confidently predicted, fully 500 homes will be built to house those of the Ford employes who want to be near their work in the big plant.

SOLIDS FOR FIRE RIGS

The Swinehart Clincher Tire and Rubber Co. has just accepted an order for two sets of solid cushion tires to be used on Seagrave motor-propelled fire combination wagons for the Vancouver, British Columbia, fire department. A guarantee is placed on these tires to the effect that they will give satisfactory service at a speed of 35 miles per hour. This fire department has had three sets of Swinehart tires in operation on motor-propelled fire apparatus during the past year. The Swinehart company claims to secure a cushion effect by means of concaving the sides, and using a secure-fastening device, which is of the cross wire type, made to fit into standard clincher rims, thus affording security against accident and protection of the fastening device against dirt and obstacles of the road. Insomuch as it is ordinarily claimed that a speed of over 12 to 18 miles per hour cannot be attained with solid tires, the company believes the British Columbia order proves that solid tires are becoming more popular with fire departments for their motor-propelled vehicles.

MILWAUKEE BUYS A RIG

The Locomobile has been selected by the city of Milwaukee for the use of the police department, making the sixth municipal car that city has in service. The Locomobile is a four-cylinder, 40-horsepower, seven-passenger touring car, designed for special police work. The police department already has a motor patrol, a Meiselbach truck carrying an Abresch special body. The chief of police department has a Mitchell touring car. The board of school directors has a Rambler; the board of public works is about to choose a car, and a number of other departments are well supplied. The latest talk in Milwaukee is to replace the fire steamers with motor fire engines, as the former become unfit for service. It is pointed out that other cities have found them successful and Milwaukee, especially now that it is proposed to annex many square miles of outlying territory, will need a quicker dispatch than the horse for covering the ground.

NEW IDEAS IN TAXIS

New ideas have been developed in the new sanitary green taxicabs which have recently been placed in operation by the New York Transportation Co. President Meade, of the company, in speaking of these cabs said: "The new green taxicabs embody some ideas of our own which we believe will be widely adopted. In the first place they are cabs for four passengers, a different thing from cabs into which four passengers can be inserted. There is a full size front seat, fixed in position, and 20 inches space between the seats, allowing ample knee-room. The in-

terior finish, however, is the most novel feature. Public conveyances must be kept clean or their use becomes not only disagreeable, but perhaps an actual menace to health. We discarded cloth for seat cushions and backs long ago as being cheap-looking, uncomfortable and impossible to keep clean, but in these cabs we have gone further and made a body which can be kept absolutely clean and sanitary. This has been accomplished by doing away with the cloth top lining and, in fact, with all cloth, lace and other dirt-collecting material, and finishing the interior instead with hardwood and metal. The cushions, seat-backs and arm rests are comfortably upholstered in leather and are all removable so that the entire interior of the cab can be thoroughly washed and cleaned. Other good features are ample power, provision for trunks and hand luggage, and the location of the driver on the left-hand side where he is better able to watch other vehicles.

KIBLINGER "TROUBLE WAGON" USED BY AN INDIANA TELEPHONE COMPANY

"As has always been our practice, the taximeters on the new cabs are driven by the front wheel and not by the rear. It is only necessary to see the rear wheels of a cab spinning idly on slippery asphalt to appreciate the importance of this little detail to the man who hires the cab. Rear wheel driving of taximeters is prohibited in some cities but it is still allowed here, I regret to say.

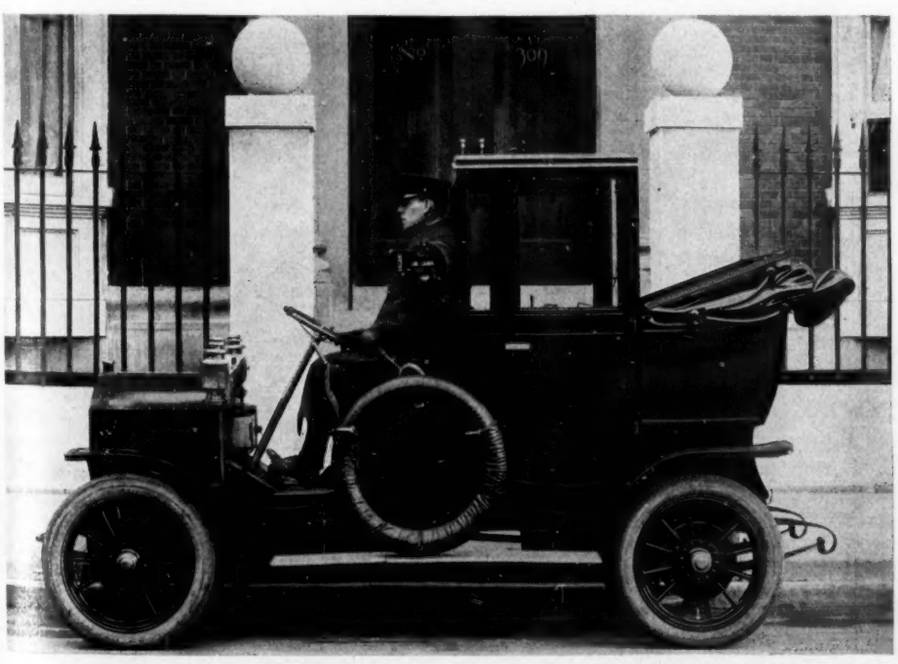
"Some advanced ideas have also been worked out in the new winter uniforms of our drivers. A green taxicab driver must present a smart appearance and at the same time be clothed so as to be well protected against cold, snow and rain. The most competent and skillful driver cannot perform his work properly if insufficiently clad. In the uniforms of the German army officers the problem has been given scientific consideration, and our cloth is specially woven to similar specifications and cannot be duplicated except by ourselves. Our drivers' coats are nearly water-proof and furnish the maximum of warmth with a medium of weight."

IN QUANDARY OVER TRUCK

Considerable difficulty is being experienced by the Indianapolis board of public safety in selecting a motor truck for the use of the alarm and telegraph system of the fire department. The board received bids for the truck on December 2, bids of $1,650 each being submitted by the Indianapolis Motor Vehicle Co., representing the Rapid; Motor Place Garage Co., representing the Sayres and Scoville; the Waverley Co. and the Coppock Motor Vehicle Co., of Decatur, Ind. The board decided not to take an electric truck, fearing that the battery charge might not be sufficient for a 20-hour run, as is sometimes required in the service, although realizing the number of good points in favor of the electric. Each of the three members of the board is in favor of a truck of different make and no two members can agree on any one truck.

FOR COMMERCIAL CARS ONLY

The T. F. Robinson Motor Co., of Minneapolis, has about completed a new garage located close to the wholesale district on Seventh street and Second avenue north, which is 50 by 200 feet, with a repair shop 20 by 90 feet. The garage and repair shop is used for commercial cars only. The repair shop is operated night and day so that most all repairing is done at night, which assures owners of trucks constant service through the day. The company has twelve 2 and 3-ton cars in its garage which it is said is the largest number of gasolene trucks in any garage in the northwest.



ONE OF NEW YORK TRANSPORTATION CO.'S GREEN TAXICABS

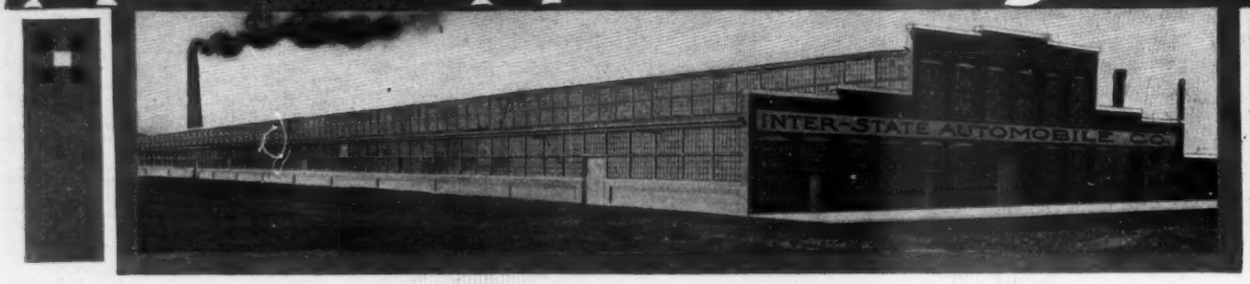
WILL USE CHALMERS CABS

The Citizens' Taxicab Co., recently organized, is about to give Cleveland its first real taste of motor cab service. Heretofore there have been a number of rumors of such concerns, but nothing tangible has developed. The Citizens' Taxicab Co. is partially backed by the Charles B. Shanks Co., of Cleveland, and in it are interested R. H. Williams, manager for Charles B. Shanks, and W. B. Davis, of the same concern. In addition, considerable stock is to be sold locally. Twenty cabs have been ordered.

ORDERS TWO RAPID CARS

An order for two twelve-passenger Rapid sightseeing cars has been placed with the Indianapolis Motor Car Co. by Lee R. Finehout, of that city, who expects to increase his sightseeing business next season. He purchased one car of similar design this season and has had considerable success.

AMONG the MAKERS and DEALERS



IMMENSE NEW PLANT OF INTER-STATE AUTOMOBILE CO., BUILT IN 6 WEEKS AT MUNCIE, IND.

Has Ford Agency—The Excelsior Repair Co., of Madison, S. Dak., has taken the Ford agency.

Represented in New York—The Auto Pump Co., of Springville, N. Y., has opened a New York office at 101 West Sixty-sixth street, Phillip O'Neill having been appointed manager.

Cup for Salzman—The Standard Roller Bearing Co. has presented a silver cup to George Salzman for the latter's consistent work in the Vanderbilt in a Thomas Flyer which was fitted with Standard bearings.

Lambert Agent Moves—The Lambert Automobile Co., Baltimore agency for the Maxwell car, has removed its headquarters from Roland Park, on the outskirts of the city, to Chase street, near Charles street. This is in the heart of the motor car center.

Putting Up Concrete Garage—Rudolph Hartman, of Milwauke, millionaire furniture and house furnishing dealer, is building the first all-concrete garage in Wisconsin and the experiment is being watched with much interest. The garage is 25 by 30 feet in dimensions, reinforced with steel. It will be used for private purposes only.

Gets Loco Expert—Herbert Harold, of Bridgeport, Conn., a mechanical expert from the Locomobile company's factory, has joined the Wisconsin general agency for the Locomobile, the Schreiber Motor Car Co., Milwaukee, as superintendent of the repair and mechanical departments. He succeeds Robert Drach, who piloted the Locomobile to victory in two 24-hour races in Milwaukee.

Places Royal in Hub—George J. Dunham, who has just been chosen president of the Royal Tourist company, was in Boston last week arranging matters so that he could leave for Cleveland to take up his residence permanently. He left the Hub Monday for the west. Mr. Dunham was in the bicycle business for several years before he engaged in the motor industry. For the past 5 years he has represented the Royal Tourist cars in Boston. He has arranged it so that the cars will be handled in Boston by the firm bearing his name, but F. Carleton Dole, who has been associated with him for some time, will be in charge, Mr. Dole having been elected president of the Boston company.

Davis Promoted—Morgan R. Davis, a well-known Quaker City tradesman, has been promoted to the general managership of the Penn Motor Car Co., Philadelphia agent for the Mitchell.

Firestone Recruit—Charles P. Saunders, for a number of years prominent in the rubber business in Philadelphia and New York, has joined the sales force of the Philadelphia branch of the Firestone Tire and Rubber Co.

Straubel Company Moving—The Straubel Machine Co., of Green Bay, Wis., manufacturer of gasoline engines and motor car and marine motors, is about to occupy its new factory on Pearl street, Green Bay. One of the features is a brass casting department.

Handling the Pennsylvania—The Auto Motor Co. is the name of the new organization which is to handle the Pennsylvania car in Boston. M. A. Dykeman, formerly of the Randall company, and James T. Nelson are the men behind the firm. They will have the New England territory and offices have been fitted up in Park square near the Motor Mart.

Big Garage in Oskaloosa—D. P. McClure is building a huge garage in Oskaloosa, Ia. The building itself will be 60 by 120, two stories high and the material will be brick, belted with Bedford stone. There will be cement floors throughout, a light and roomy shop and salesroom. The general office and private office will be furnished in green weathered oak. The large basement will be used to carry surplus stock. There will be intercommunicating telephones in all departments. The building will be heated with steam throughout and lighted inside and out with an independent electric lighting plant. This plant is being constructed with a view to carrying a large and complete stock of supplies and sundries for both wholesale and retail purposes and will be operated in connection with McClure's garage at Ottumwa, Ia. Both these houses are devoted exclusively to the sale of Buick cars with the exception of two lines of electrics.

Handling the Buick—The Puerner-Heid Automobile Co. has been organized at Jefferson, Wis., to take the agency for the Buick line.

Making a Battery—A. N. Rumsey, 245 Jefferson avenue, Detroit agent for the Columbus electric, is manufacturing an ignition and lighting battery.

Grout Branch Opened—The Grout car has just been added to the Quaker City colony, the Grout Automobile Co. having opened a branch at 1521-23 Spring street, with Wilson H. Stayle as manager.

Monarch Incorporates—The Monarch Motor Co., of Milwaukee, has filed articles of incorporation and was granted a charter. The capital stock is $20,000 and the incorporators include John Godfrey and William W. Welch.

Fighting Street Car Company—The South Side Business Men's Association, of Pittsburg, is so enraged over the car service on that side of the Monongahela river that it is shaping up its plans for establishing a motor car line to compete with the crowded, slow and unsanitary cars.

Veteran Changes—F. C. Lindoerfer has resigned his position in the sales department of the Oscar Lear Automobile Co., and has become sales and advertising manager of the Autocar Equipment Co., Buffalo, N. Y. Mr. Lindoerfer entered motoring 8 years ago with the Haynes-Apperson Automobile Co., and later was associated with the Elmore Mfg. Co.

New Trade Idea—William T. Taylor, manager of the Philadelphia Oldsmobile branch, celebrated Thanksgiving by giving a dinner at the Bellevue-Stratford to upward of half a hundred agents in his territory, including Pennsylvania, New Jersey, Delaware, Maryland, Virginia, West Virginia and the District of Columbia. Manager Taylor has introduced an innovation in the shape of a school for the instruction of the local Oldsmobile employes in all the mechanical details of the car, so that when a man is sent out with a car he is as thoroughly posted as if he had factory training. With so many experts

within easy reach the Olds owners in and near the Quaker City can seldom be at a loss in a pinch.

Now With Overland—William S. Gilbreath has severed his connection with the Waverley Co. and now is associated with the Overland in Indianapolis.

Maryland's E-M-F Agent—The Motor Car Co., of Baltimore, Howard W. Gill, president, has closed the agency for the E-M-F. The firm has secured as territory the entire state of Maryland.

Has Motor Car Department—The A. Wood Mfg. Co., Third avenue, Pittsburg, dealer in machinery and electrical supplies, has added a motor car repair department to its establishment and has arranged to put in a line of motor car delivery cars for the purpose of delivering merchandise for the downtown merchants.

Demonstrating Ambulance—The Dodge Motor Co., of Boston, has had the Pope-Hartford ambulance in Boston for some time giving demonstrations to hospital officials as to its many qualities. This ambulance was built for the city of Hartford to be used in connection with the hospitals there. Boston has a few motor ambulances, but there is room for more of them.

Needs More Room—The Schaefer Engine Co., of Berlin, Wis., which recently removed from Ripon, Wis., to Berlin, already finds itself cramped for room, and will at once erect a storage warehouse and a large garage and motor car repair shop. The repair department is one of the largest in central Wisconsin, and cars are sometimes shipped 50 miles to Schaefer works. The company also builds new motors.

Baltimore Changes — The Baltimore agency for the Lozier machine has been taken up by the Southern Auto Co. The Pierce-Arrow agency, which was formerly carried by this firm, has been placed with the Foss-Hughes Co., which has offices in the Equitable building, while the Southern Auto Co. is still located at Dolphin street and Mount Royal avenue. The agency for the Overland has been taken over by Charles S. Houghton, who has opened up headquarters at 329 Calvert building.

Building $50,000 Garage—A new $50,000 garage is to be erected on the south side of Mount Royal avenue, between St. Paul and Charles streets, Baltimore, by the Zell Motor Car Co., E. Stanley Zell, president, Baltimore representative for the Peerless and Chalmers-Detroit. The structure will be of fireproof construction and will be three stories high, 50 feet front and 100 feet deep. The salesrooms and showrooms will occupy the whole of the first floor, a full view of which will be had through plate glass windows which will extend along the entire length. Ornamental facade press brick will be used, while the trimmings will be either of terra cotta or cut stone. The company has already purchased the lot and commissioned Edward H. Glidden, architect, to go ahead with the plans.

Hanriot a Sales Manager—Henri Hanriot, the French race driver, is in charge of the provincial and foreign sales departments of the Societe Francaise des Automobiles Benz.

Receives First Taxi Order—The Autocar Co., of Ardmore, Pa., is at work on its first taxicab order—five vehicles for the Baltimore Taxicab Co. The contract was secured in competition with several other types.

Oakland Wheel Sizes—An error was made in the advertisement of the Oakland Motor Car Co. in Motor Age when it was stated that the four-cylinder car was equipped with 32-inch wheels. They are 34-inch and will be fitted with 4-inch tires.

Hoosier Concern Quits—The Reagan Motor Car Co., which has represented the Haynes in Indianapolis, has gone out of business and the Haynes is now without a representative in that city. The company made its headquarters with the Indianapolis Motor Car Co. The latter company announces that its building will be devoted entirely to commercial motor vehicles and top building in the future.

New Pittsburg Concern—The Palmer-Singer & Simplex Pittsburg Sales Agencies is the rather long title under which the agency of these two cars is now handled in Pittsburg. The company is located in the Machesney building on lower Fourth avenue and will build a garage in the east end next summer. It will establish branch agencies throughout its country territory at once.

Loco Must Move Branch—After a legal battle covering more than a year the Locomobile company in Boston is forced to move from its splendid new quarters on Newbury street. The order to vacate was made by the court a few days ago and the firm has until December 15 to comply with the court's wishes. Kenneth M. Blake, manager of the Boston branch, has been hustling about ever since trying to secure suitable places for his customers. When they were notified about it they took the matter in good spirits, and all were willing to do what they could to help out the situation. So did some of the Boston dealers who had garages. The Locomobile garage was built by Eugene N. Foss, a millionaire, and it was erected purposely for the company. It was finished more than a year ago. When it was under construction some legal difficulties arose, nearby residents objecting to it, and as they held land with restrictions they took the case to court. It was thought a compromise might be reached, but nothing came of it and so Mr. Foss decided to fight the matter to a finish. Through one court after another the case went until it reached the supreme court of the state. This tribunal decided that the restrictions against having any building to be used for business purposes erected on the site were valid. That ended the matter.

Poyer Building—D. F. Poyer, of Menominee, Mich., is building a large brick garage and repair depot to cost $15,000, on Main street, Menominee. He will occupy it about December 20.

Post & Lester to Move—Post & Lester, one of the biggest firms dealing in accessories in Boston, is having a large salesroom fitted up in Park square into which the company is to move in a few weeks.

Error in Franklin Ad—Through a typographical error which appeared in the advertisement of the H. H. Franklin Mfg. Co. in the issue of November 19 and 26, the price of the 1909 model D touring car was given as $2,700 instead of $2,800.

New Corbin President—Charles Glover succeeds Howard S. Hart as president of the Corbin Motor Vehicle Corporation, of New Britain, who recently resigned. It is rumored that the Corbin Motor Vehicle Corporation will be segregated from the American Hardware Corporation, though definite plans in this regard are not as yet known.

New Garage at Belvidere—Thomas S. Beckington, formerly assistant superintendent of the St. Louis Motor Car Co., at Peoria, and Bert R. Lucas, of Belvidere, have formed a partnership as Beckington & Lucas and are building a new brick and cement garage at Belvidere, Ill. The building is expected to be completed by Christmas. It will be 90 by 40 feet.

Doubling Capacity—Owing to its big business this season, the Buick-Losey Co., Indianapolis, has arranged to double the capacity of its salesroom and garage. A building in the rear of the one it has occupied in East New York street has been leased and the two buildings connected by a large tunnel. The tunnel is large enough to admit the passage of a motor car. The front of the main building is to be torn out and a solid plate glass front will be put in, with a large display window for accessories on the second floor. R. H. Losey, manager, states that 302 cars have been sold through his branch this season.

Inter-State's Big Plant—The Inter-State Automobile Co. has taken possession of its new plant at Muncie, Ind., and is busily engaged in installing machinery for the manufacture of the Inter-State car. The plant is a huge structure and the remarkable part of it is that it was built in just 6 weeks. Three days after the organization of the company, 3 months ago, negotiations were opened for the purchase of 20 acres of land, which was in the company's possession in a week. Ten days later the workmen were grading and laying foundations. The plant is 250 feet wide, 540 feet long and contains 135,000 square feet of ground space.

Legal Lights and Side Lights

CODIFYING STATE LAWS

THE secretary of the Massachusetts highway commission, Austin B. Fletcher, is at work now arranging a codification of the Massachusetts motor laws. The legislature at its last meeting passed an act ordering the motor laws to be codified and when this is done, which will be shortly, it will allow of an opportunity to get immediate results to follow the recent meeting of the governors of New England at Boston. As the legislature meets in January and begins at once the work of preparing legislation, the codification will no doubt be presented in time to enable everyone interested in motoring to get some idea of what is needed in the way of some uniform law. The incoming executive, Governor Eben Draper, will be able to get much valuable information from the highway commission which may be embodied in his inaugural address. As the motor vehicle law of this state, which was passed in 1903, was the one upon which the other New England states based their statutes, naturally they look to the Bay state for advice in working out problems relative to motoring because of the vast experience of the commissioners in Boston. Nothing has as yet been announced concerning what changes in the law are proposed, but it is reasonable to assume that two points at least will be given serious consideration. One of these relates to reckless driving and the operation of cars by persons incompetent to handle them. The other will be the elimination of the local regulations which are used in some towns as merely unjust persecution, and when not of that nature they are worked for financial considerations. It has been recognized that arbitrary speed limits are practically useless except for trapping motorists, and that while speed is always a factor, yet the conditions of the road should be taken into consideration by the authorities.

FIGHTING TOLL ROADS

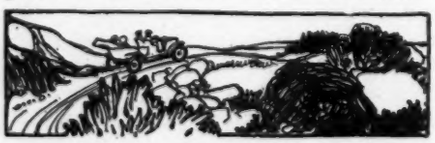
Motorists all over western Pennsylvania are enthused at the prospect of getting some live good roads legislation at Harrisburg this winter. The papers from one corner of Pennsylvania to the other have taken up the matter editorially and are hammering away at the state authorities in a manner that must make them feel mighty uncomfortable if they do not intend to keep their promises made before election. The most important feature of this proposed legislation is the entire doing away with toll gates. It is almost certain some state measure will be enacted to either purchase these gates or abandon them by some other means and Governor Stuart is seeking all the advice he can get from all sources with a view of determining the best method of procedure.

RECOGNIZING DIPLOMATS

Massachusetts motorists are already beginning to hand out their $5 antes to the Massachusetts highway commission for their next year's registrations. The money does not become due until January 1, but the highway commission has arranged that those who wish to have their old numbers up to 5,000 may apply before the first of the year for them. The commission some time ago let out the contract for the new numbers for next year. These will be different from the old numbers so that they may be easily distinguished. The background of the new numbers are of dark blue and the letters are of white. The old plates were white with blue figures. The members of the diplomatic corps, many of whom summer at the north shore, are to have special numbers which will not cost them anything. This plate will bear the letter D in front of the number. In the past there has been difficulty with some of the diplomats who refused to recognize the state law or pay the registration fee, and so the law was changed to cover their cases. Last year the commission allowed a month for the registration after the new year began, and there was some confusion getting out the registrations. This year there will be no such time. A large force has been engaged to facilitate matters, and it is expected that the work will be attended to promptly. Notices are being sent to all owners of motor cars notifying them to re-register if they wish to use their cars. Many people have stored their cars for the winter and this will ease up on the rush a bit.

LIMITING HEADLIGHT POWER

The Detroit common council is wrestling with a proposed ordinance, limiting the candlepower of motor car headlights. The exact figure at which a light shall be declared illegally luminous and blinding to other occupants of the city's highways is what is bothering the aldermen, and Corporation Counsel Hally is conducting a number of experiments with popular makes, to determine just how much candlepower they develop. A fine of not to exceed $500 or imprisonment for not to exceed 6 months is the penalty attached to the proposed measure which has the support of a number of influential aldermen.



HOLLAND CUTS SPEED LIMIT

Some time ago, against the wishes of the minister of commerce of Holland, the lower house passed a law whereby cities and municipalities are permitted to fix the maximum speed limit within the city limits for motor cars, motor cycles and bicycles to 10 kilometers—6.2 miles—per hour. Recently the higher house—something like the senate in the United States—had to pass upon this project, and again, notwithstanding the opposition of the minister of commerce, the bill was made a law by a vote of 26 to 16. Tests were made in Scheveningen a few days before the matter came up in the high house. At these tests, which were arranged by the leading motorists of various large cities, the attendance was made up largely of the highest government and city authorities, such as the ministers, mayors, aldermen and a great number of high and low house members who were interested. One of the first tests was that of a motor car going at the rate of 10 kilometers an hour and of a pedestrian walking. The pedestrian beat the motor car without much trouble. In another test in which the motor car was going at the 10-kilometer speed and a cab at its natural gait, the latter made the horseless vehicle look as if it was a toy machine so great was the difference in the space separating the two rigs at the end of a kilometer. Even horse-drawn trucks went faster than the motor car. At the conclusion of the tests several of the minister and representatives were expressing their surprise at the results which were so favorable to the motor car that it was generally thought they would not pass the bill.

TAXI PROBLEM IN DETROIT

An interesting question is now in the hands of Detroit's city legal department, relative to the licensing of motor cabs which at present pay no fee to the city for running, in spite of the fact that the cabs have developed a very lively competition for the horse-drawn vehicles which have formerly monopolized the field. The Auto Express Co., which is running the taxis, alleges it would be glad to pay the license but for the fact that it would be unable to do business at the rate which the horse-drawn vehicles have to maintain. The latter are governed by regulations based on a charge per hour while the taxis naturally charge by the mile. The owner of the motor cabs wants an amendment to the law, making a separate class for his vehicle. Unless something of this sort is done, he will obviously have to pay the license or go out of business, according to a ruling of the corporation counsel's office.

Brief Business Announcements

Los Angeles, Cal.—A new garage is to be erected at Twelfth and Pico streets for John D. Hooker.

Kansas City, Mo.—The Dempster Machinery Co. has been appointed local agent for the Locomobile.

New York—Shappard Brothers, formerly of Mt. Vernon, have been appointed agents for the Oakland.

Springfield, Ill.—The Central Garage Co., of Chicago, has been incorporated with a capital stock of $1,000. It will conduct a garage.

Springfield, Ill.—The Standard Automobile Station, of Chicago, has been incorporated with a capital stock of $2,500, to deal in motor cars and also operate a garage.

New York—Walter A. Wood, formerly treasurer and general manager of the Cleveland Motor Car Co., has been appointed sales manager of the local branch of the Mora Motor Car Co.

Columbus, O.—The Auto Supply Agency Co., of Cleveland, has been granted permission to change its name to the Motor Supply Agency Co. E. T. Harsay is the president of the Company, and A. K. Spencer secretary.

Philadelphia, Pa.—The Standard Motor Co. has opened its salesrooms at 616 North Broad street. William P. David is the president and manager of the company. The new concern has secured the agency for the Middleby car.

Paoli, Ind.—Rhodes Brothers, the proprietors of the bus line between this town and New Albany, are about to install a motor bus. The change of motive power will enable them to make the round trip daily, instead of three times a week, as formerly.

Pittsburg, Pa.—The Arlington Motor Car Co., of 5971 Center avenue, East End, which was formerly known as the East Liberty Auto Co., is making plans for the erection of an addition to the building. The concern has the agency in this city for the Jackson.

New York—F. T. Sanford, formerly connected with the Napier Motor Co., of England, and later in the business in Boston, has opened a garage on Forty-third street, west of Fifth avenue. He has the exclusive agency for the Thomas Flyer.

Kokomo, Ind.—The Apperson Brothers Automobile Co., of this city, manufacturer of the Apperson, has filed articles of incorporation under the laws of the state of Indiana with a capital stock of $400,000. The reorganization will not effect the business. The officers of the company remaining the same. The company simply takes over the entire business of the former concern.

San Francisco, Cal.—Robert G. Fowler has opened a garage in Gilroy in partnership with his father, Thomas Fowler.

Columbus, O.—The Auto Renovator Mfg. Co., of Cleveland, has been incorporated with a capital stock of $50,000.

York City, Pa.—The Hart-Kraft Motor Co., manufacturer of light gasoline delivery wagons, has closed a contract with the Post Motor Co., of New York city, to build 1,100 wagons.

Oskaloosa, Ia.—W. A. McNeill has secured the contract for the erection of a two-story brick building, which is to be occupied by D. F. McClure as a garage and salesroom.

Cleveland, O.—H. E. Deisher, who has been engaged in the motor car business under the name of the Park Motor Car Co., has sold out. The concern will be continued under the old name.

Brooklyn, N. Y.—The Campbell-Corwin Co. has filed a certificate with the secretary of state, changing its name to the Montauk Garage Co. G. M. Stratton is the president of the company.

Pittsfield, Mass.—William J. Baughman has resigned as superintendent of the Stanley electric plant, having been appointed selling agent for the General Vehicle Co., of Long Island City. His territory includes all east of Rochester and north of Poughkeepsie in New York state, and western New England northwest of the Connecticut river. The General Vehicle Co. manufactures an electric truck, and is controlled by the General Electric Co., which corporation is also interested in the Stanley company.

Providence, R. I.—Hitchcock Banks Motor Car Co., capital stock $25,000; to deal in motor cars, etc.

New York—Cameron Motor Car Co., capital stock $150,000; to manufacture motors, engines, cars, etc.

New York—Aero Tire & Supply Co., capital stock $1,500; to handle motor cars.

New York—Greater New York and Suburban Transportation Co., of Manhattan, capital stock $20,000; to manufacture motor vehicles.

Harrisburg, Pa.—Markel-Light Motor Car Co, of Pottstown, capital stock $150,000.

Dover, Del.—Paton-Henderson Automobile Co., of Omaha, Neb., capital stock $50,000; to deal in motor cars.

Columbus, O.—Farmobile Mfg. Co., capital stock $200,000; to deal in and manufacture motor cars and like vehicles for farm work.

Springfield, Ill.—International Automobile Co. of Chicago, capital stock $20,000; to manufacture motor cars, motors, etc.

Scranton, Pa.—Lackawanna Automobile and Taxicab Co., capital stock $10,000.

San Diego, Cal.—A company is to be organized here to place taxicabs on the city streets. W. W. Sloan is representing the taxicab people.

Los Angeles, Cal.—The Bakersfield Garage Co. has purchased property at Nineteenth and F streets, and will erect a large garage.

San Francisco, Cal.—The tire factory of H. W. Bogen, which is located at Allister and Larkin streets, was burned out with a loss of more than $10,000.

Boston, Mass.—The Rhode Island Machinery Co., of Pawtucket, has been incorporated with a capital stock of $25,000 and will manufacture and deal in motor cars, supplies, etc.

Albany, N. Y.—The Stewart & Clark Co., of New York city, has been incorporated with a capital stock of $500, and will manufacture and deal in speedometers and motor car supplies of all kinds.

Kansas City, Mo.—George Tebeau, owner of the Kansas City Blues, a baseball club, has decided to go into the motor car business. He will open salesrooms at 1716 Grand avenue, where he will represent the Stearns.

Los Angeles, Cal.—J. S. Conwell, who has been the general manager of the Auto Vehicle Co., has handed in his resignation to the officers of that concern, and will take charge of the local branch of the Maxwell.

Jacksonville, Fla.—The Manhattan Auto Co., of New York city, is about to establish a branch business in this city. H. R. Anderson and C. J. Knittell are to be in charge of the car, which will make four sight-seeing trips a day.

Newark, N. J.—F. R. Laisant, who has been in partnership with A. N. Brunner, in the New Jersey Automobile Co., of Irvington, has bought out the interest of his partner and will conduct the business himself in the future.

Nashville, Tenn.—J. O. Caldwell, formerly of Boston, has just established the Regal Motor Co. in this city, with headquarters at 145 Third avenue. In addition to representing the Regal the new concern will conduct a garage and repair shop.

Pittsburg, Pa.—C. W. Nichols and R. J. White, of 1012 Wood street, have purchased the business and goodwill of the Wilkinsburg Machine and Mfg. Co., and have fitted up a repair plant. They will also carry a full line of motor car supplies and accessories.

Development Briefs

NEW WARNER AUTO-METER

DELIVERIES are starting on the 1909 Warner Auto-Meters. The new model, known as type K, shows a refinement in detail, although the principle of the speed-indicating part remains the same. The shape of the instrument, though, has been changed from the tubular sort to one of a watch-shaped type. Five new features are found in the instrument, leading off with a 99,999-mile season odometer and including a 1,000-mile trip odometer, a simple resetting device, an illuminated dial and a simplified shaft-drive. It is claimed that a 10,000-mile season recorder is inadequate to the needs of the modern motorists, so it has been increased ten times so that now it will be possible to note the work of a car for several seasons. The resetting device works like the stem of a watch, one turn setting it back to zero. The case is made of heavy drawn brass, inclosed in which is the working mechanism of the instrument. The dial is silvered metal, the figures being etched in black. For use at night is a small incandescent light, which is inside the bevel glass cover and above the dial, which permits of the mileage being read at a glance, no matter how dark it is. By the use of an improved drive the speed of the shaft is decreased to one-half that at which the Warner shaft used to be driven, which saves wear and tear and is claimed to eliminate the need of abrupt bends in the shaft. It is said that this shaft speed is one-fourth that at which other speedometer shafts are operated.

WARNER'S COMBINATION AUTO-METER

SUB-TITLE FOR RAYBESTOS

Friction Facing is the new sub-title, given by the Royal Equipment Co. to its product, Raybestos—a composite asbestos and copper wire fabric used for lining brakes and clutches. A salient feature of this lining, and the one causing the change in its descriptive name, is its friction-creating quality. It has been proven, it is said, to produce more friction to metal than metal in the interior of brake drums and for use in lining clutches in motor car construction.

NEW ROYAL FEATURES

A change is noticeable in the 1909 Royal, compared with previous models. The old style progressive gear change is superseded by the four-speed selective type, while the motor has been enlarged to 5½ by 6. This gives a motor that should develop at least 65 horsepower. The Bosch magneto is used, a unique system of wiring being employed. A double oiling system also has been incorporated, while several small mechanical details have been altered. The wheelbase has been lengthened to 126 inches, while the spring construction differs from that used heretofore. The spout on the radiator has been changed in design to give an oblong effect instead of the tall affair which formerly distinguished Royal cars. One of the principal changes is a new carbureter, which has been designed after months of work by Robert Jardine, designer of the Royal, who will continue to serve in the same capacity with the reorganized Royal company, which is once more upon its feet.

DIAL OF NEW WARNER AUTO-METER

VELIE WILL MAKE CARS

The Velie Motor Vehicle Co., of Moline, Ill., will, before the new year, place on the market the Velie, built by workmen who have for years been engaged in making vehicles. The Velie Motor Vehicle Co. was organized less than a year ago with a capital of $400,000. A four-story plant was started some months ago at Moline and is not completed. This plant is 80 by 200 feet and is situated next to the plant of the Velie Vehicle Co., of Moline, one of the largest vehicle manufacturing establishments in the country today. While the same men are interested in the two concerns, the companies are two separate and distinct propositions. The new motor vehicle company has the following officers: President, W. L. Velie, who is also president and the largest stockholder in the Velie Vehicle Co.; secretary and general manager, Major L. M. Fuller, formerly of Washington, D. C., and connected with the ordnance department of the United States army for years; directors, George N. Peek, Omaha, president of the John Deere Plow Co., of that city; S. H. Velie, Kansas City, also connected with the Deere Plow Co., of Kansas City, and C. D. Velie and C. C. Webber, officers of the Deere & Webber Co., of Minneapolis. In the northwest the Deere & Webber Co., of Minneapolis, will be the wholesale and retail agent for the new Velie car, and this large firm is but one link in the system of the distribution planned by the new company. The designer of the Velie car, C. D. Rose, of Detroit, has been working on this new motor car for over a year. Rose was formerly with the Thomas people in Buffalo. The Velie car will be equipped with a motor which is rated at 30 horsepower. It will have four cylinders, cast in pairs, and of the water-cooled type. The frame will be of pressed steel and with a 2½-inch drop. Aluminum will be largely used in the construction of parts like the crankcase and fan. The lubrication will be operated by a pump, gear-driven. Sliding transmission of the selective type, three speeds forward and reverse, will be used. The wheelbase of both models will be 110 inches and the clearance under the flywheel 10½ inches. The line will include the regular touring car type roadster with either double rumble seat, single rumble, tourabout or baby tonneau types. It is understood that plans have been made at the factory to turn out 1,000 cars. The list on the roadster includes a full equipment consisting of magneto, five lamps, speedometer, odometer, horn and full tool and tire kit, most of which accessories are generally charged for by some motor car manufacturers.